REPORT RESUMES

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FACILITIES FOR EDUCATION IN VA HOSPITALS. FINAL REPORT.
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THIS STUDY WAS AUTHORIZED BY THE VA DEPARTMENT OF MEDICINE AND SURGERY FOR THE PURPOSE OF IDENTIFYING AND DETERMINING THE FACILITIES NEEDED TO PROPERLY HOUSE AND SUPPORT EDUCATION ACTIVITIES IN EXISTING AND FUTURE VA HOSPITALS AND TO PRODUCE ARCHITECTURAL GUIDANCE IN THE DESIGN OF THE FACILITIES. CURRENT PRACTICES AND SIGNIFICANT TRENDS IN MEDICAL EDUCATION WERE OBSERVED AT THIRTY-FIVE INSTITUTIONS TO DETERMINE THE ROLE OF THESE HOSPITALS IN SUPPORTING EDUCATIONAL PROGRAMS, IDENTIFY ESSENTIAL EDUCATIONAL FACILITIES, AND RECOGNIZE THE SPECIFIC CHARACTER OF VA HOSPITAL FUNCTIONS AND THE NATURE OF ITS POPULATIONS. FROM GENERAL CONSIDERATIONS ON PLANNING AND PROGRAMMING TO MEET EDUCATIONAL NEEDS, ADEQUATE SPACE PROVISION, RECOGNITION OF CHANGING NEEDS AND ENVIRONMENTAL FACTORS, DETAILED DESIGN STUDIES FOR SPECIFIC RECOMMENDED FACILITIES WERE DEVELOPED. EACH DESIGN STUDY EXPLAINS THE INTENDED FUNCTION OF THE FACILITY, AND INCLUDES A DETAILED FUNCTIONAL PROGRAM WITH ASSOCIATED GRAPHICS. TWO CASE STUDIES ARE PRESENTED TO ILLUSTRATE APPLICATION OF THE RECOMMENDATIONS FOR EDUCATIONAL FACILITIES IN PLANNING NEW VA HOSPITALS. THE GENERAL PLANNING PROCEDURES WERE CRITICALLY REVIEWED AND SUGGESTIONS OFFERED FOR POSSIBLE IMPROVEMENT. ALSO INCLUDED ARE SKETCHES FOR ALTERING FOUR EXISTING VA HOSPITALS TO INCORPORATE THE EDUCATIONAL FACILITIES RECOMMENDED. (BH)

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FACILITIES FOR EDUCATION IN VA HOSPITALS

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FACILITIES FOR EDUCATION IN VA HOSPITALS

1930

the final report of a two-year project sponsored by the department of medicine and surgery of the veterans administration and conducted by the architectural research staff, school of architecture, rensselaer polytechnic institute, troy, new york

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ABSTRACT

The affiliation of Veterans Administration hospitals with medical schools throughout the country, a program now in its twentieth year, has been successful and effective. Thousands of medical students, residents and health science trainees annually receive a substantial part of their education under this program. Its full effectiveness is not being realized, however, because *VA* hospitals lack adequate educational facilities. Recognizing this deficiency, the *VA* Department of Medicine and Surgery, in 1963, authorized a study to be undertaken to determine and identify the facilities needed to properly house and support educational activities in its hospitals and to provide architectural guidance in the design of the facilities. This report presents the findings of that study.

In planning such facilities, it is essential to first review the current status and trends of medical education in general, and to analyze the specific character of the *VA* hospital functions and the nature of its population. This has been done, and the discussion of these topics constitutes Part I of the report. With this background information, the role of these hospitals in supporting educational programs can be determined, and the identification of essential facilities logically follows.

Part II of the report deals first with the general problems of planning and programming the needed spaces, and then presents a series of detailed design studies and figures illustrating specific recommended facilities. These are classified under three categories, — those serving the hospital in general, those related to a service, department or floor of the hospital, and those which are needed in each nursing unit. For each design study, the intended function of, and need for, the facility is first explained in full, and a detailed functional program accompanies each graphic presentation.

To illustrate how these recommendations would affect the overall planning of new relocation hospitals, two "case studies" are presented, listing the specific educational facilities needed in typical 720-bed and 1040-bed *VA* hospitals. Also, because the actual realization of such facilities in adequate measure depends to some extent upon procedural policies, the general *VA* planning procedures are critically reviewed, and suggestions are offered for their possible improvement. And finally, to demonstrate the applicability of the design recommendations to existing, as well as new hospitals, sketches are included illustrating how alterations might be made in four representative *VA* hospitals to incorporate the educational facilities they require.

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INTRODUCTION

Background

Role of the Dean's Committee

Many Veterans Administration hospitals, since 1946, have been affiliated with medical schools throughout the nation, — an association which has benefited the hospitals in many ways, including a marked improvement in patient care. This relationship functions under the aegis of Deans' Committees, appointed by the Chief Medical Director. These Committees approve all appointments of medical staff in the hospitals operating under this affiliation program.[1]

Resources for education

Of paramount significance is the fact that this national resource of many hospitals and outpatient clinics has been, and is, an important factor in the education of a large number of medical students, physicians, nurses, therapists of all kinds — in fact, the entire spectrum of the health sciences.

Extent of clinical medical education

The relationship has proven to be eminently successful and effective, as is attested in studies made by the Association of American Medical Colleges.[2] Currently, 89 *VA* hospitals are actively affiliated with medical schools, and the Veterans Administration has become the largest single source of clinical experience in connection with medical and health service education. *VA* facilities are being used increasingly by medical schools for the teaching of physical diagnosis in the preclinical years, and for clinical clerkships in the last two years of medical school. In 1964 over 1800 second year medical students took their physical diagnosis work in *VA* hospitals, and about 6600 third and fourth year medical students were assigned to *VA* hospitals for a part of their medical clerkships. At the graduate level, some 3000 residents hold appointments in *VA* hospitals.

Training for the health sciences

The Veterans Administration has also been playing an increasingly important role by providing on-the-job training for nursing and allied medical and administrative disciplines. Over 60 *VA* hospitals provide basic professional training for about 4000 nursing students, and more than 2800 other health science trainees receive a part of their professional education in the *VA* system.

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[1] Policy Memorandum No. 2, January 30, 1946

[2] Journal of Medical Education, February 1960, Vol. 35, No. 2, pp 188-9

INTRODUCTION

Educational facilities to support VA's obligation

The Veterans Administration's Department of Medicine and Surgery is conscious of its growing obligation to contribute to these programs by providing adequate teaching facilities. Most of the *VA* hospitals now in use were built soon after World War II, and it is felt that their lack of even the most fundamental educational facilities is a serious handicap to the effectiveness of the program. This lack is the result of two factors — facilities for education were never originally planned, or if they were (which is rare), they have been taken over for other pressing needs. If the best possible medical care is to be provided for patients, it is essential that facilities conducive to teaching, study, and research be provided and maintained.

Improve existing and provide new facilities

Moreover, since the *VA* makes extensive use of professional medical talent, claiming the full time services of about 5% of all practicing physicians in the country, it should not only provide continuing training for its own personnel, as a Federal agency, but should also lend support to medical education in general. Although the *VA* is primarily a medical service organization, it is felt that in view of these obligations, educational needs have been seriously neglected in the planning of its hospitals. It is considered essential, therefore, that existing facilities be improved and new spaces created to better serve the educational needs of the *VA* system and the medical community.

Authorized roles of the VA in education

The legally authorized activities of the Veterans Administration are currently limited to medical service and research. It has the right to appoint residents and interns because this enhances the care of its patients, but there is no specific legislative authorization to engage in medical education. The Administrator of Veterans Affairs has stated the policy that replacement hospitals are to be constructed in proximity to medical schools, whenever possible. This means the *VA* hospital will become more and more an integral part of the medical facilities and educational programs of the community and region.

Reasons for educational facilities

In the briefest of terms, appropriate and adequate facilities for education should be provided:

- for the support of teaching programs in the health sciences
- for expanding the *VA*'s contribution to medical manpower
- for strengthening the affiliation between the *VA* hospital and the medical school
- for attracting and holding an excellent professional staff
- for the continuous upgrading and updating of medical care and treatment

Objectives of the Project

Correct deficiencies and anticipate the future

This project was initiated in July 1963 to provide advice which may assist in correcting the deficiencies now existing in *VA* hospitals in respect to the housing of current educational programs, and in the anticipation that *VA*'s role in education will at least continue at the present level and may be expanded. If this latter develops, there will be an immediate need for various types of facilities to support expanded and more comprehensive educational programs.

Objectives of the project

The purpose of the project, therefore, has been to develop criteria and planning guidance to meet the needs of educational programs, both in existing *VA* hospitals and in those still to be built. To accomplish this purpose, it was considered essential to:

- identify current practices and significant trends in medical education
- define medical education activities which should be provided for in *VA* hospitals
- determine what facilities are needed to properly house and support these activities
- develop criteria and recommend designs for these facilities
- provide planning guidance in establishing proper functional relationships between these facilities and other areas of the hospital
- establish guidance in programming the proper facilities to meet particular local needs

Development of planning information . . .

The aim has been to provide specific planning information which will encourage more effective use of existing hospital facilities as well as aid in the planning of new ones. Special attention has been given to new teaching methods and techniques including the use of electronic and projected media as instructional aids.

. . . specifically for educational facilities

It should be emphasized that the primary concern was *not* with general hospital planning, but with *those spaces accommodating educational functions of the hospital.* Since it is impossible, however, to distinctly separate educational functions from those of research and patient care, the interrelationship of all these functions is necessarily an important consideration in planning for any one of them. While the planning studies have been primarily aimed at the design of specific spaces or room types, there has also been concern with the relationship of those spaces to each other and to the functions of the hospital in general. *In essence, the aim is to improve the total environment within VA hospitals for medical education.*

No standard plans

It is not the intent, however, to present "standard plans" or mandatory detailed room layouts, even for these spaces. Instead, the design studies are intended to serve as *planning guidance,* sufficiently flexible to be applicable to a variety of local situations.

Concern also with administrative procedures

Two other matters of concern have been the administrative procedure by which local needs are identified and translated into reality, and the manner in which private architectural and engineering services are utilized. It was felt that if suggestions could be made for improving these aspects of current practice, this may also contribute substantially to the realization of needed facilities.

Report directed to VA . . .

This report, presenting conclusions and recommendations resulting from the study, is directed to the persons within the Veterans Administration who have the responsibility for programming, planning, and carrying out construction projects. It is intended to provide them with *suggestions* as to methods of housing educational programs, *justification* for their provision, and *guidance* in their design and planning.

. . . but should be useful to others

Although the project was concerned specifically with facilities for *VA* hospitals, this report should be of value to all who are concerned with any aspect of planning better facilities for medical education in any type of hospital.

Conduct of the Project

Report of an architectural research project

This is the report of an architectural research project conducted by members of the faculty of a school of architecture. Because some readers may not be familiar with the manner of conducting such a project, a brief review of the methodology employed is presented.

Advisory Committee

At the outset of the project, and at the request of the project staff, an Advisory Committee was appointed by the Chief Medical Director, Department of Medicine and Surgery, Veterans Administration. The five members were selected for their knowledge of medical education and its requirements, but each was considered to represent a somewhat different point of view and background. The Committee has met four times during the course of the project to review the work and conclusions to date, and to recommend methods and procedures, and has been very helpful. Names of the Committee Members and *VA* officials who participated, together with the places and dates of the meetings, are listed in Appendix A-1.

Visits to VA hospitals

To determine the nature of current educational progress and needs, a number of *VA* hospitals were visited by the project staff. Each visit was pre-arranged to facilitate contact with proper parties and to insure that the visit would be profitable. Without exception, excellent cooperation and a great deal of valuable information has resulted from these visits. Appendix A-2 lists the hospitals and dates of the visits.

Visits to medical schools

In most cases, the *VA* hospitals visited were affiliated with medical schools, and because these affiliations are a major factor in the definition of facilities, it was considered advisable to spend some time in each of the affiliated schools. Visits were made also to several leading medical schools which do not currently have *VA* hospital affiliation. The focus of all such visits was on the facilities for the clinical aspects of the teaching programs. On a number of occasions, long conferences were held with the dean and departmental chairmen, and these also produced much helpful information. Appendix A-3 lists these visits.

Hospital plans and programs

For additional information and for comparative purposes, plans and programs for a number of medical school and *VA* hospitals were obtained and analyzed. Several of these are presented in Section 5 of Part II as examples of remodelling existing hospitals to accommodate educational facilities.

Extended hospital observation

It was considered essential that at least one member of the project staff make an extended visit to a *VA* hospital to observe its operations in detail, and to talk informally with staff members at all levels and in all departments. Such a visit was made to the Albany *VA* Hospital from January 22 to 28, 1964.

Literature survey

A great deal of published material was gathered and reviewed in search of current available information and guidance. With one or two exceptions, however, very little contemporary, useful material was found on the specific subject of teaching hospitals—their functions, needs, facilities and planning.

Invitational Seminar

There are a number of new medical schools, either recently built or being planned, throughout the country. Because they represent a wide range of experience in the planning of teaching hospitals, it was felt that much could be gained by bringing together people representing these schools to discuss how the hospital should be planned for teaching and what the educational role of the hospital may be in the future. A day-and-a-half seminar was accordingly arranged in Washington, D. C. on June 11 and 12, 1964. A resume of the seminar and a list of participants are presented in Appendix B.

This seminar accomplished three important objectives:

1. It provided the project staff with a capsule summary of important trends in clinical medical education and its required facilities.
2. It provided the source material for a statement regarding the role of the hospital in medical education for widespread dissemination and reference.
3. It served as a forum for the interchange of ideas among people whose major responsibility is providing for medical education.

Meetings and conferences with VA officials

Several times during the project, members of the project staff met with various members of the *VA* Central Office Staff to explore specific programs, interests, or procedural policies.

Programming data

At the conclusion of the investigative phases of the project, a list of basic assumptions, planning premises, and facility types was drawn up for review by the staff and Advisory Committee. The continuing expansion and refinement of this programming data became the framework of the information contained in this report.

Design studies

As soon as the types of facilities required for education were defined, work began on the preparation of design studies. As refined and presented in this report, the design studies are used to explain the concept of a particular facility type, to offer guidance in planning and design, and to indicate appropriate design solutions.

Interim report

In the fall of 1964, an Interim Report was printed and distributed in limited numbers. It contained a summary of the work to date, a discussion of representative planning considerations, a number of selected design studies, and a report of the Invitational Seminar. The interest and reaction to this Interim Report proved most valuable and helped establish the scope and character of this final report.

In addition to these research activities, the project staff participated in a number of conferences and informal meetings; of the latter group, the most challenging were the day-by-day deliberations within the staff as the work of the project went forward.

PART I

EDUCATION AND THE VA HOSPITAL

1. EDUCATION FOR THE HEALTH SCIENCES
2. EDUCATIONAL ROLE OF THE VA HOSPITAL

I. EDUCATION FOR THE HEALTH SCIENCES

Introduction

Not a history of medical education

The evolution of educational processes in the health sciences field is a chronicle of developments in the techniques and methods of patient care, in the discovery and application of new knowledge through research, and in the methods and organization of transferring knowledge and experience to the new generation. For the purposes of this report however, it is important to briefly review only the present organization of education in the health field, with particular emphasis on those phases which take place in the hospital, and to point out those apparent trends which are affecting or will affect the role of the hospital.

Current Practices

For the physician, the steps in education are:

Pre-medical

- four years of pre-medical education terminating in a baccalaureate degree, usually with major emphasis on science. (Some students may enter the medical school after three years of college work.)

Medical school

- four years of general medical education, of which the first two years are devoted to basic sciences—anatomy, physiology, bio-chemistry, pharmacology, pathology, and microbiology — and the latter two years to acquiring basic information and practical experience in clinical sciences such as psychiatry, pediatrics, obstetrics and gynecology, radiology, anesthesiology and medicine and surgery and their sub-specialties. The Doctor of Medicine degree is awarded by the Medical School upon completion of this work.

Internship

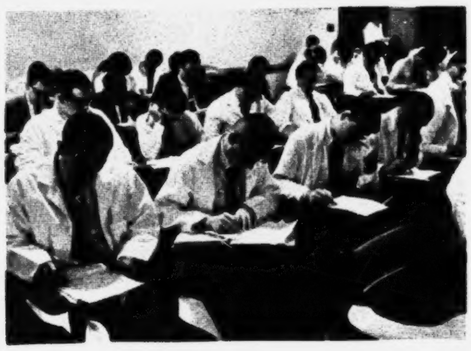
- one year (sometimes more) of internship, which gives practical day-by-day hospital experience in patient care and treatment. The internship may be either "straight" — concentration on a special area; "mixed" — concentration on two or three areas; or "rotating" — experience in many areas.

Residency

- two to seven years of a residency, which provide extensive experience and opportunities for acquiring skill and competency in the particular specialty in which the doctor has elected to practice. Meeting the established standards for the length of time and quality of residency is required for eligibility to take the examination of the American Board in each of the different specialties in medicine. The certificate of the appropriate American Board attests the physician's competence in his specialty.

Post-graduate

- post-graduate education and research, which provides opportunities to come back into the teaching-learning environment periodically, to keep up-to-date and to gain new knowledge.



The locations for education

As the student progresses through medical school, his contact with patients increases, and the scene of his education shifts from the laboratories and classrooms of the basic sciences to the nursing units and clinics of the hospital. Lectures, recitations, laboratories, and conferences — formal, scheduled, group-oriented learning processes — give way to more and more informal, personal, non-scheduled, practical learning experiences involving the patient, the doctor-preceptor and small numbers of other students. The basic hospital offers the medical student and doctor valuable and varied opportunities for experience and learning. However, these opportunities can be more fruitful, more productive, and more effective, if appropriate facilities are conscientiously provided within the hospital to specifically support teaching-learning processes.

Educating health scientists

Education in other health sciences follows a similar format, in that the acquiring of basic knowledge and skills is followed by practical experience in the hospital. Some programs such as nursing, hospital administration, psychology, and social work involve formal, four-year or longer basic collegiate programs including, or followed by, the hospital experience. Others, such as laboratory and x-ray technology, vocational nursing and nursing assistance, various therapies and dietetics, may be based on short, intensive, non-degree programs or on two-year associate degree programs. Any of these may be preceded by a general college education, but in all cases, the terminal practical experience takes place in the hospital setting.

Basic hospital a bare minimum

But the basic hospital itself is the bare minimum as an instrument for teaching. If the educational experience is to be most efficient, effective and valuable, appropriate facilities, equipment and staff must be added.

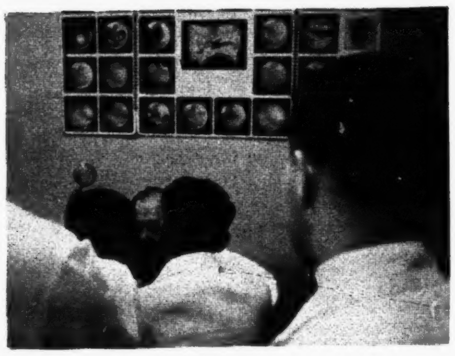
Trends in Education for the Health Sciences

Anticipating changes when planning

To be valid, the planning of educational facilities must anticipate future needs as reflected by current trends in education for the health sciences. The following discussion deals in general terms with such trends and the influence they will have on the hospital environment, but no attempt has been made to establish an order of magnitude and priority. How these influences may be reflected in the planning of a teaching hospital is a matter of prime concern, and is considered both here and elsewhere in the report.

Integration of basic and clinical sciences

The division between basic and clinical sciences expressed by most medical school curricula is slowly being dissolved as the two become increasingly interrelated. Students are becoming involved with patients very early in medical school; the taking of physical diagnosis by first and second year medical students, in the hospital setting, is quite common. Similarly, patients are being demonstrated either in person or through the use of films and television, in connection with basic science teaching. All evidence indicates that this fusing of basic and clinical sciences is a well established trend which will expand.



One effect of this trend on facilities within the teaching hospital is the need to provide space for more students — more space in the conference room on the nursing unit as well as in the large teaching auditorium, in locker rooms and in library facilities. Another is the need for student laboratory facilities in the clinical setting. It may well be that a section of the nursing floor will be renovated for student laboratories, or each floor may eventually contain a sit-down, stand-up laboratory for medical students. The provision of a student clinical laboratory as discussed in Part II-3 is an immediate step in anticipation of this future need.

Training of personnel as members of the health team

With continuing specialization in the health fields and the creating of new specialties and roles, it becomes more important that medical personnel be trained as a team. No one member of the team is self-sufficient; no one can perform alone. It is important that each understands the capabilities and limitations of the others, and that each is aware of his role and his responsibilities and the part that he plays in relationship to the others.

The team approach in training requires the provision of inter-disciplinary facilities, and the juxtaposing and relating of facilities to bring the team members together naturally. Some ways of doing this are illustrated in the suggested designs for facilities on the nursing unit and the nursing floors. (Part II-3 and 4)

Training of new types of personnel

"Twenty-five or thirty years ago the patient was cared for by the nurse, by the maid or dietician, and by the doctor intermittently. Now, by actual count, there are twenty-two different types of people who, on the average, visit a given patient during a given interval of stay."* This statement highlights a significant trend in the development of new types of personnel and specialized groups, many of whom must be trained wholly or in part within the clinical setting. The impact on facilities throughout the clinical setting is obvious. It suggests also that more equipment and more elaborate equipment must be available for training purposes, as many of the new roles are the direct result of expanded technology in medical care and cure. Some estimates indicate that the number of health science personnel being trained in the hospital will double within the next ten years, while the number of doctors being trained will increase by only 25 per cent.

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* Gerhard Hartman speaking at the Invitational Seminar.

Increased concern with pedagogy

The medical staff and the hospital setting are no longer regarded as constituting a complete system for education. Education for the health sciences is becoming more concerned with the art and science of teaching and learning — with pedagogy. This is reflected in a number of experiments exploring new systems of instruction to meet specific learning objectives, and by the increasing support being given the doctor-teacher in his teaching role. The proper equipment, the necessary resources and instructional aids, and appropriate supporting staff, are beginning to be provided to make his teaching more effective and more efficient. Where content was the primary concern previously, method is now being considered. Certainly, this project itself reflects this greatly increased concern with pedagogy and with providing the necessary facilities, equipment and staff to support the teaching process.

Use of supplementary instructional resources

In the clinical setting the patient is the major instructional resource, and around him revolve most learning experiences. Recently, however, many supplementary and complementary materials and methods have been developed to extend the value of the patient as a teaching resource. Films, slides, television, models, mannequins, and simulations are all being employed in this manner. Not only can these be used to amplify and expand certain phases of patient care and cure, but they can be easily stored and made readily accessible at appropriate times. Many of the facilities illustrated in this report are designed to permit the use of these supplementary aids.

Training for comprehensive care

The health care team appears to be assuming more and more responsibility for the total health needs of man in his environment. Programs in preventive medicine, family care, community medicine, public health, and rehabilitation all indicate this concern with the broadest scope of services. To provide training of a similar broad scope, there is a need for a broader spectrum of patients and teaching opportunities outside the hospital, in the homes and institutions of the community. Undoubtedly, the hospital will remain the focal point of training and education but its educational sphere will extend far beyond its own premises; a wider range of patients, particularly ambulant patients and family groups, will be encouraged to come into the medical center as part of the learning experiences for students and trainees.

Training medical students for roles other than practicing physicians

As with other professions, medicine is finding that there are very significant roles for its graduates in addition to that of the practicing physician. The growing need for teachers, for medical researchers, for administrators, and for other nonpracticing roles is obvious. Consequently, it's essential to provide a *variety* of experiences in the teaching hospital, permitting the medical student to learn at first hand of other opportunities which may better suit his interests and talents.

Concern with continuing education

It is no longer merely desirable, but necessary, for the practicing physician to keep abreast of new developments in the techniques of care and cure. Consequently, there is increasing concern with methods of bringing current information periodically to the practicing physician. These methods may involve radio and television extension courses, regional seminars and conference sessions, or short courses and special programs within the teaching hospital. The medical center is, of course, the logical focus for such activities by virtue of its programs in research, education, and care. Programs of continuing education may occur at many points in the hospital — from the teaching auditorium to the nursing unit — and will involve other members of the health team as well as the practicing physician.

Another aspect of this concern is the need for instilling in the medical student a concern for continuing learning. Habits of lifetime learning such as the study of the latest journals must be developed and encouraged, both in medical school and in the teaching hospital. The availability of learning resources of all types, and the provision of facilities for individual work and study are prime essentials to the development of such learning habits.

Changes in the concept of the internship

Although *VA* teaching hospitals have few internship programs, it is important to note that the concept of the internship seems to be undergoing study and possible change. It may be that the functions of the present internship will be divided and added to the clinical clerkship and the residency. In this case, the distribution and patterns of use of educational facilities in the hospital will be altered.

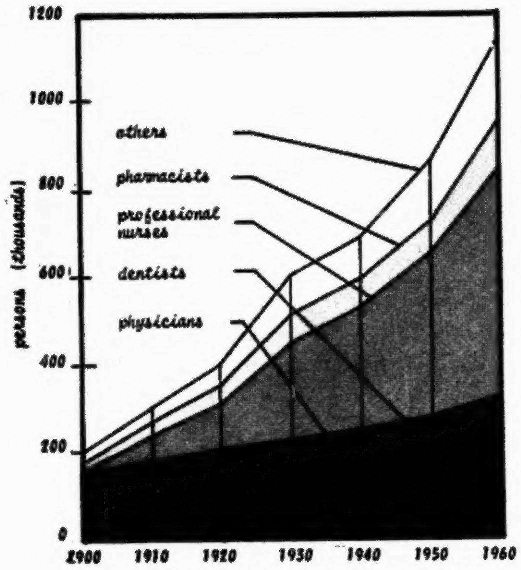
Control of the total environment

A matter of particular interest to the architectural planning of teaching hospitals is the increasing interest in the regulation and control of the total environment. It may soon be technically possible to prescribe and regulate the patients' *total* environment, affecting all *five* senses. The control of temperature, air movement, lighting, humidity and air pollution are the beginning of this. Soon the doctor may prescribe the environment for care and therapeutic purposes just as he now prescribes treatment or drugs, and this holds very significant implications for the planning and design of space. This same concern with the total environment may be carried into the educational programs where the senses of touch, smell and taste, as well as those of sight and hearing, will be used far more extensively to support instruction.

Concern with the availability and flow of information

Finally, the availability of the right kind of information at the proper time, in the appropriate mode and at the point of use is becoming more and more a concern in the teaching hospital, both for patient care and for teaching. This concern with information flow goes far beyond the limits of the single hospital; it encompasses the medical center, the region, and the entire medical world. The simplest hospital communication system, put into use now, must be planned as a component for an extensive information retrieval system in the future, and the relationship of this system to regional and larger networks must be considered. This concern with communication and information flow is reflected by both the planning and the design details in facilities such as conference rooms, examination-treatment rooms and patients' rooms.

The Need for Education in the Health Sciences



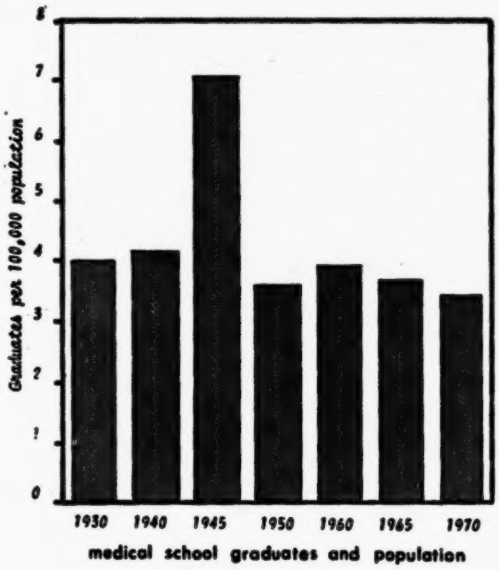
growth of selected health professions

Another prerequisite to the planning of facilities for education in *VA* hospitals is an assessment of the current need for the end product of this education — the doctors, nurses, researchers, psychologists, and other members of health science team. Is there an adequate supply? And what does this mean for *VA* hospitals?

There can be no doubt that the need for trained medical science personnel is constantly increasing. Many reasons for this may be cited, but probably the following are the most important:

Why are more health personnel needed?

1. *Increase of population:* The total population of the country is increasing; consequently, more people are requiring medical care.
2. *Aging population:* A larger percentage of the population is made up of the elderly. Advances in medical care and treatment, preventive medicine, public health and improved diets have resulted in more people living longer, and this larger group of older people imposes heavy demands on health care.
3 *Greater insurance coverage:* A far larger percentage of the population is covered by health insurance plans of various sorts than ever before. With the cost of care assured, a person is more likely to request medical care than he would be if it involved added personal expense.
4. *Complexities of care:* The added complexities of medical care and treatment require more personnel with highly specialized skills. Open heart surgery, for example, not only gives more people a chance to live longer, but requires additional specialized technologists, special nursing care, and specialized support personnel.
5. *Broader scope of services:* Medical care now includes more than merely the care of the sick and injured. Community health, public health, family care and preventive care and other such programs require medically trained personnel to serve in many capacities.
6. *Increased concern:* Finally, there is an increasing general concern with health problems and the need to find solutions. Private and public support of research is a reflection of this, as are domestic welfare and health care programs and private and public aid in ministering to the health needs of underdeveloped countries.



The seriousness of this increasing demand for personnel is augmented by the limitations of the training potential of the country's institutions. Until very recently, few medical schools have been established since the early 1900's, and those that were well established have not increased their enrollments significantly. Because of the lack of facilities and faculties, and increased costs of medical education, the production of M.D.'s has not kept up with the increase in population, not to mention satisfying the other five reasons why more health science personnel are needed.

More domestic medical personnel needed

Statistics regarding the physician-to-population ratio do not reveal a particularly dramatic lack of physicians. However, "the maintenance of the physician-population ratio in recent years in entirely due to the influx of graduates of foreign medical schools. The U.S. medical graduate-population ratios show that, since 1955, the increase in output in this nation's medical schools has not kept pace with the increase in population. This figure has fallen from 4.2 in 1955 to 3.8 in 1963."* An increase in *domestic* medical personnel of all kinds is necessary.

Increased demands for training opportunities

New schools and expanded schools will require commensurate increases in hospital learning experiences, and there is no doubt that the total educational system for health science personnel must expand. The hospitals, as part of this system, will be required to extend their teaching opportunities and facilities, and to add new opportunities and programs. The demands on the teaching hospital will not even be a proportional increase; they will increase disproportionately as the hospital becomes the setting for a larger share of the total teaching and training job. The provision of educational facilities just to meet the demands of current programs is not sufficient however; foresight and planning must allow for increased demands; demands which may be met, in part, by the *VA* system.

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* "The Supply of Physicians" — an editorial by William F. Maloney, Associate Director, Association of American Medical Colleges.

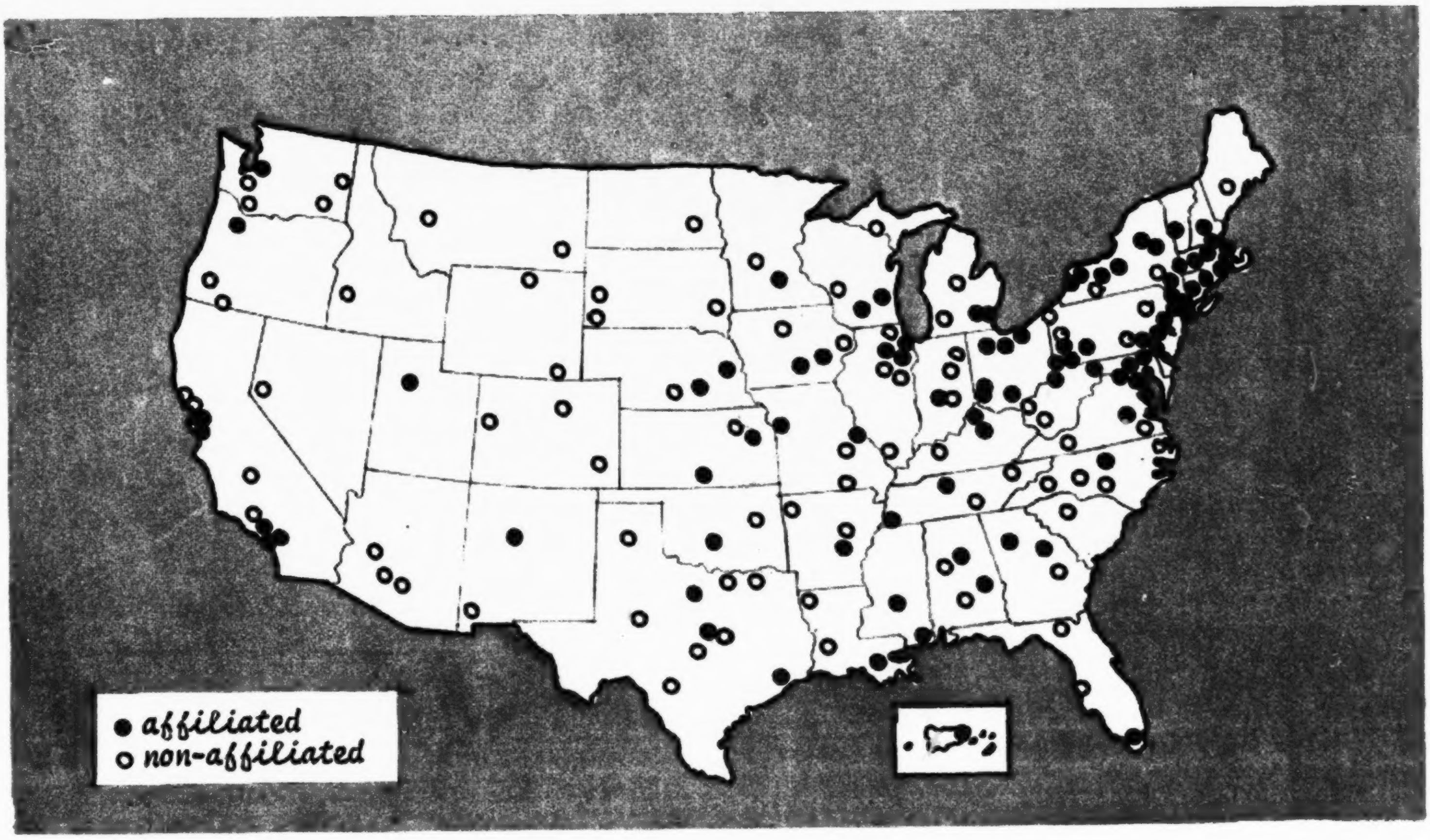

● affiliated
○ non-affiliated

Figure 1. Geographic location of VA hospitals and those affiliated with medical schools.

2. EDUCATIONAL ROLE OF THE VA HOSPITAL

Introduction

World's largest system of hospitals

The Veterans Administration hospital system, with its 168 hospitals and over 200 outpatient clinics, constitutes the world's largest facility for patient care which is available also for the support of research and education. It is important, therefore, in the consideration of educational facilities, to first examine the resources for education which this system offers, review its current educational programs, and consider how the physical relationship of the hospital to the medical school may affect its educational role.

Resources for Education

Hospitals, OPD's, and clinics

Figure 1 shows the geographic location of the 168 *VA* hospitals throughout the country and indicates the 89 hospitals that are affiliated with medical schools. The total hospital system represents over 119,000 beds; in addition, hospital outpatient departments and separate clinics have a yearly total, system wide, of 6.2 million visits.

At one time it was the *VA* policy to build special-use hospitals such as those for psychiatric and tubercular care. In recent years, however, this policy has changed, and the following principles are generally in effect when planning hospital resources:

Policy on planning hospital facilities

- No more specialized hospitals are to be built
- Existing single-use hospitals are to be remodeled to accommodate other types of care
- Existing general medical and surgical hospitals are to have psychiatric units added to them.
- New relocation hospitals are to be affiliated with medical schools
- Whenever possible, hospitals will be physically a part of a medical center

Staff and personnel

In addition to the resource of hospital facilities, the *VA* system also has staff and personnel available for teaching and training. It employs over 5,500 medical doctors and a total of over 135,000 personnel. The medical staff of the *VA* hospital may be characterized as follows:

Characteristics of the staff

- A high percentage of the staff is employed full time, and their sole obligation is to the *VA* hospital
- The resident-to-intern ratio is very high due to the small number of interns in the *VA* system
- High standards are maintained in terms of appointment, pay scale, and professional status
- In the affiliated hospitals, many of the *VA* staff hold academic appointments in the medical school

Characteristics of the patients

The resource of patients is composed of both the in-patients who are admitted to the hospitals and those patients who visit the out-patient departments and clinics. This overall patient population has certain unique characteristics, among the most important of which are the following:

Advanced age

- In 1963 the average age of the *VA* hospital population was 53.4 years, and this figure is, of course, steadily increasing. Unless a major war occurs, to bring in a younger veteran population, the aging trend will continue. A significant factor contributing also to this high average age, as compared with that found in general hospitals, is the fact that there are no obstetrical or pediatric patients.

Extended length of stay

- The median length of patient stay in *VA* hospitals in about 20 days. This high average is due to the presence of a sizeable core of long-term chronic cases, and the proportionately high number of psychiatric patients. Also, of course, there are no short-term maternity or pediatric cases.

Very few female patients

- The percentage of female veteran patients is generally low, and there are no facilities for obstetrical cases.

Large psychiatric load

- Approximately 50% of the total veteran population are psychiatric patients, and of these, about 15% are also in need of general medical care.

High proportion of general medicine and surgery cases

- While most teaching hospitals cater to the acutely ill and unusual cases, the *VA* hospital patients represent the more common types of medical and surgical cases — the "bread and butter" type of medical practice.

Other resources

Besides its hospital facilities, staff and patients, the *VA* system offers large resources of equipment for medical care and treatment — equipment which may be made available anywhere within the system. It also has the largest possible collection of medical records and histories, as resource material for research and educational purposes. Furthermore, as a tax-supported Federal agency, the Veterans Administration has financial resources and anticipated continuing support not generally available to private institutions.

It seems that the inherent unique assets of the *VA* hospital system, in respect to the support and conduct of educational and training programs, derive from 1) the advantages of a large organization, 2) its special type of patient population, and 3) its well-established affiliation with medical schools.

A large system

As a very large hospital organization, the system offers opportunities for:

- Extensive educational programs under experimental conditions
- Communal use of facilities, staff, equipment and teaching resources
- Regional and national networks for information storage and retrieval
- Regional and national systems of communication, of particular value in civil defense and programs of continuing education

Special patient population

Its unique patient population provides opportunities for:

- Extensive geriatric studies
- Studies of chronic diseases
- Comprehensive psychiatric research and studies
- Extensive training opportunities for health science personnel, particularly in the fields of therapy and rehabilitation
- The study of progressive patient care, especially in the minimal care and self-care stages, since many *VA* patients are in these categories
- Experience with general medical and common surgical cases, which are becoming comparatively rare in other teaching hospitals

Established process of affiliation

With its well-established affiliation with medical schools, the scope of the *VA*'s education and training programs can be easily expanded, and their emphasis can be modified and shifted as required. The resources of the *VA* hospital system can also be readily made available to new medical schools as appropriate additional affiliations develop.

Must recognize liabilities as well as assets

An objective appraisal of resources, however, must recognize liabilities as well as assets. While the special characteristics of the *VA* hospital system offer some unique educational advantages, as have been noted, they also impose certain limitations which should be acknowledged. Some of these are inherent in the *VA* system, while others are restrictions which can be minimized, if not eliminated. The following are considered to be the more significant of these limiting factors, and it should be noted that the last item listed is a limitation which hopefully this report may help to alleviate:

- The *VA* hospital does not provide a total clinical experience for medical training
- Under present regulations, outpatient departments in *VA* hospitals cannot serve as effectively for teaching as might be desired
- In some cases the physical distance between the *VA* hospital and the affiliated medical school is a deterrent to fully effective educational programs
- A precise definition of *VA*'s role in medical education has been lacking, and some medical schools feel that this has handicapped their own planning

- The rigid financial control essential in a large system restricts the autonomous allocation of funds for educational needs at the local level
- Many of the facilities required to adequately house and support educational and training programs are lacking in *VA* hospitals

Current Educational Program

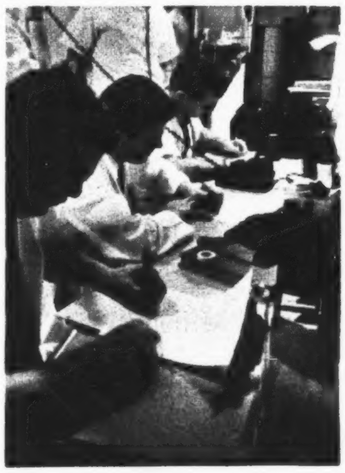
Extent of affiliation

Since the establishment, in 1946, of the Dean's Committee system of affiliation, 89 *VA* hospitals have become affiliated with medical schools. Additional relocation hospitals, either under construction or in various stages of planning, will also be affiliated with existing or new medical schools. In effect, each such affiliated *VA* hospital becomes an educational arm of the medical school, inasmuch as the Dean's Committee recommends staff appointments, and the hospital assumes responsibility for residency training programs as well as the education of medical students and other health science personnel.

The Veterans Administration is not authorized to operate a medical school or any other formalized health training program, but through their affiliation with various schools *VA* hospitals do play an important role in education and training. The precise characteristics of this educational program would be difficult to define, because its nature varies somewhat with each affiliation and its local program. Its magnitude on a system-wide basis, however, is indicated by reiterating these statistics:

Magnitude of education and training

- Over 3000 medical residents hold appointments in *VA* hospitals
- About 1800 second-year medical students took physical diagnosis in *VA* hospitals in 1964
- About 6600 third- and fourth-year medical students currently serve a part of their clerkship in *VA* hospitals
- Over 4000 nursing students annually receive training in *VA* hospitals
- Over 2800 other health science personnel receive on-the-job training in the *VA* system



Types of personnel

For some programs there may be only a few students or trainees in any one year, while in other areas many hundreds are enrolled. The following list of personnel, though incomplete, indicates the scope of this educational program and the variety of specialized training provided:

- residents in medicine, surgery, psychiatry, physical medicine and rehabilitation, pathology, radiology, urology and other specialties
- medical students — first- and second-year students for physical diagnosis and other introductory clinical courses, and third- and fourth-year students in clerkships involving medicine, surgery, psychiatry, and physical medicine and rehabilitation
- therapists, including speech, occupational and physical
- clinical and counseling psychologists

- dietitians
- professional nurses, practical nurses, and nursing aides
- dental interns, residents, and hygienists
- social workers
- medical technologists
- anesthetists
- medical administrators
- postgraduate clinical investigators and research associates

Opportunities for expanding programs

Thus, with *VA* participation and assistance, the medical school can not only expand its teaching program in such areas as these, but may also be able to undertake other programs which the mutual advantages of affiliation make possible.

Hospital-School Proximity; Its Effect on the Educational Program

Affiliated and non-affiliated hospitals

In respect to educational activities, *VA* hospitals in general may be broadly classified as two types: 1) those which are affiliated with medical schools, and 2) those which are not. And the affiliated hospitals, in turn, may be considered, for purposes of comparing educational programs and facility requirements, under two headings: a) those in close physical proximity to the medical school, and b) those which are physically remote from it. It is with the affiliated hospitals, whether close to the school or not, that this study is principally concerned, though many of the facilities recommended will be found appropriate, too, in non-affiliated hospitals. In examining the effect of physical proximity on the educational role of the hospital, it seems appropriate, therefore, to discuss first the two conditions applying to affiliated hospitals, and then to consider what part the non-affiliated hospital can play in supporting education.

a. *The Affiliated Hospital in Close Physical Priximity to the Medical School:* It seems an accepted philosophy, not only within the Veterans Administration but outside it, that the affiliated *VA* hospital should be physically, functionally and emotionally a part of the medical center. Its physical separation from the school seems to detract from optimum conditions for teaching; connecting links such as bridges or tunnels are highly desirable, and happily the planning of the newer relocation hospitals reflects this concern with physical togetherness.

Close proximity of the hospital to the medical school results in such benefits as these:

Convenience and time saving

- Hospital and school staff members can readily be brought together for meetings, conferences or instruction; faculty members with a half hour to spare can easily visit the wards to hold informal conferences with students and residents; and consultants from the medical school can get to classes, rounds and conferences in the hospital quickly and easily.

Flexibility of educational programs

- If it becomes desirable for the medical student to have clinical experience during his first or second year, such experiences are close at hand. The trend is towards expanded elective courses at all stages of the medical curriculum, and the hospital can more conveniently provide the environment for some of these if it is located nearby, rather than "across town". If it is near at hand, the *VA* hospital will have an increasingly important part in all health science education.

Sharing of resources

- When the *VA* hospital is part of the medical center, the sharing and inter-institutional use of equipment, training resources, utilities, services, personnel and staff is greatly encouraged, to the common benefit of all concerned.

Joint use of facilities

- Close proximity permits the sharing, rather than requiring the duplication, of such important facilities as an auditorium, large teaching rooms, a medical museum, the production center for instructional materials, the center for continuing education, etc. Not only does this mean more adequate facilities than could be provided by either institution alone, and at less cost to each, but also that the educational programs can more readily be adapted to changing needs.

Pooling of functions and services

- Information storage and retrieval systems, educational support functions, communication systems, and some in-service and continuing education programs can be planned and provided on a center-wide basis.

Reinforcement of the affiliation

- Without formal authorization for the *VA* to participate in medical education, some medical schools feel they should not rely on using the facilities of the affiliated *VA* hospital. But the location of the *VA* hospital within the medical center, close to the medical school, should alleviate such doubts, since it represents a deliberate move on *VA*'s part to strengthen the affiliation.

Planning for common use

In short, physical integration permits the maximum benefits to be derived from affiliation, and the optimum scope of educational programs is possible in the center-oriented *VA* hospital. Adequate facilities can jointly be provided to support pre-clinical teaching, medical student clerkships, residencies, health science training of many types, in-service education, cooperative research, and even continuing education. To realize the full benefits of this relationship, however, it is essential that the *planning* of the hospital also be integrated with that of the total center, in order that the optimum use of common facilities will be insured.

Disadvantages of physical separation

b. *The Affiliated Hospital Located at Some Distance from the Medical School:* Many *VA* hospitals are affiliated with medical schools, but are physically separated from them by several blocks or perhaps several miles. In these cases, the full potential benefits of affiliation are not realized; in place of the advantages enumerated for proximity, separation results in corresponding disadvantages. The inconvenience of travel between hospital and school discourages frequent informal interchange between the staffs, students and personnel of the two institutions; the educational program is less flexible, because the school cannot take full advantage of the hospital's clinical facilities; there are fewer opportunities to share common resources, and less likelihood of developing an integrated cooperative basic-clinical sciences curriculum. Furthermore, it becomes impractical for the *VA* hospital and the medical school to plan and provide facilities on a complementary-supplementary basis; instead, their conscious duplication often becomes necessary.

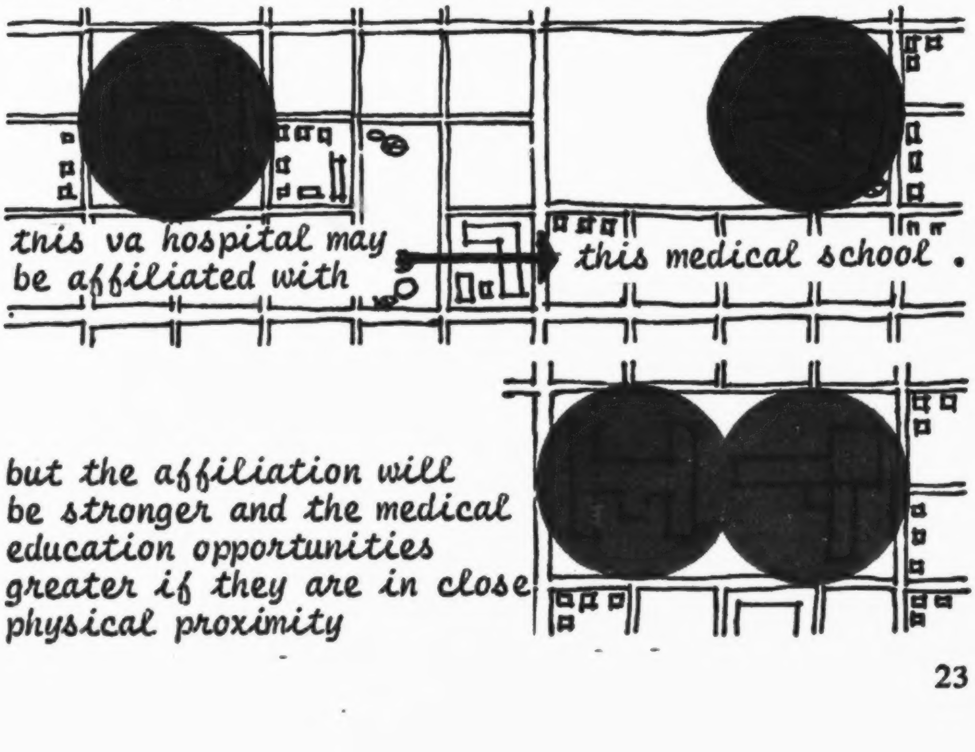
Overcoming limitations through the planning of facilities

In spite of these disadvantages, however, appropriate and important educational programs *can* be developed in affiliated hospitals remotely situated. The provision of educational facilities of the types defined and described later in this report will certainly enhance the *VA* hospital's position, and its educational role can be greatly strengthened by particular attention to such matters as:

- The development of inter-institutional communications systems — especially television — to link the school and hospital for many types of teaching — rounds, conferences, patient demonstrations and interviews — and eventually for information retrieval.
- The provision of lounge and locker facilities, as well as individual work-study areas for students and trainees to give them a "home base" and a personal identification with the hospital.
- The provision of learning resources in library-type facilities, so the student has them readily at hand, and doesn't have to rely on the distant medical school library.
- The provision of large group hospital-wide teaching facilities, which might not be required if the school were close by.

Compensatory planning

Thus, although the affiliated but remote *VA* hospital has inherent limitations in the development of its educational programs, the provision of proper and adequate facilities can compensate for many of the inconveniences and disadvantages imposed by physical separation from the school. The scope of the program in such hospitals can, in fact, be quite complete, though cooperative courses and basic-clinical science integration will likely be more difficult to achieve.


this va hospital may be affiliated with
this medical school.
but the affiliation will be stronger and the medical education opportunities greater if they are in close physical proximity

Educational roles of the non-affiliated hospital

c. *The Non-Affiliated Hospital:* Some 79 hospitals in the *VA* system are not affiliated with medical schools, but there are important roles for these hospitals, too, in the total educational program. Each of them, however, should be considered as a separate case, and each should be examined as to its current and potential programs, to determine specifically what educational facilities should be provided to most effectively implement its educational mission.

In general, when considering essential facilities, particular attention should be given to such educational programs as:

In-service training

- *In-service training for hospital personnel and medical staff:* Some small conference rooms, as well as large classrooms and teaching rooms are desirable for this type of program, and an excellent resources center or library is essential for individual reference and study. Also, the medical illustration department should take on some educational support functions such as equipment maintenance, film material rental, the preparation of transparencies, and photography.

Continuing education

- *Continuing education for physicians and health science personnel in the area:* These programs may consist of the typical profeseional society meetings and conferences, requiring classroom and auditorium facilities. If the *VA* hospital is prepared and willing to host such affairs, they will not only benefit its staff professionally, but will enhance the stature of the hospital in the community.

  Continuing education may also consist of providing resource material and library facilities for reference, research and study by health personnel in the area. It may be much more extensive, with short courses, weekly meetings, post-graduate fellowships and many other aspects of training and updating. In this case, conference rooms, classrooms, auditoria, resource facilities and educational support facilities will be essential. In areas where the *VA* hospital plays a central, focal role in medical affairs, it may even be appropriate to create a continuing education center as part of the hospital complex. This concept is explained in some detail in Part II of this report.

Part of the information system

It is important that the non-affiliated hospitals be considered as essential parts of the *VA* system-wide information dissemination and retrieval network. Because of their wide geographic distribution, the *VA* hospitals provide logical input and output points for such a nationwide system for supplying information rapidly and efficiently. The programs thus made possible have important implications not only in education and training, but in coping with natural disasters and in supplying information needed in preventive medicine.

PART II

THE PROVISION OF EDUCATIONAL FACILITIES

1. GENERAL CONSIDERATIONS
2. HOSPITAL-WIDE FACILITIES
3. SERVICE-RELATED FACILITIES
4. FACILITIES ON THE NURSING UNIT
5. PROGRAMMING AND PLANNING

I. GENERAL CONSIDERATIONS

Introduction

Beneficial planning requires certain attitudes

The needs of contemporary medical education and the appropriate role of the *VA* hospital in helping to supply some of these needs have been discussed previously. If more adequate educational facilities are to be provided in *VA* hospitals, certain philosophical attitudes should be adopted in respect to the planning of such facilities if they are to be of optimum value. It is the intent here to underline the importance of some of these general guidelines for planning.

Planning and Programming to Meet Educational Needs

Since the terms "planning" and "programming" sometimes have various meanings, it is advisable to clarify at the beginning the particular meanings intended here.

Planning defined

> *Planning* is the broader term, and includes any activity that has to do with determining objectives and needs, choosing locations, and arriving at the desired arrangement of functions, spaces and equipment, prior to construction. It *includes* programming, as well as the actual drawing of building plans. The latter process, though specifically implied by some when speaking of planning, is in reality only the culminating phase of comprehensive overall planning.

Programming defined

> *Programming* is the early definitive stage of planning, when, after due deliberation and study, decisions as to policy, objectives, functions and needs are committed to writing. Two successive stages of programming are essential; first, the functional program, defining the purposes and scope of the project, and the functions to be served; and following this, the architectural program, listing in detail all of the spaces needed to serve these functions, along with their areas, relationships and equipment. Both of these programs are sometimes combined within one document.

The importance of thorough planning of the hospital appears to be well understood in the *VA* system. For each new project, a Master Plan is studiously developed, documenting in comprehensive form first the functional and then the architectural program. These Master Plans contain adequate information as to requirements, except for one deficiency; far too little consideration is given to educational needs. Educational facilities, as such, are not normally programmed. Educational needs cannot properly be met by token commitments, or by assigning space on an arbitrary or random basis. Like all other essential needs of the hospital, educational programs must be carefully programmed with the thoughtful consideration of their functions, usage and equipment.

Educational facilities not programmed

It is essential, therefore, that the educational role of the *VA* hospital be determined in the early planning stages, and that the educational policies and program of the affiliated schools be taken into account in the initial programming of each hospital. The educational activities of the hospital should be described in the same way its many other functions are. The Dean's Committee should have an opportunity at this stage, before building concepts begin to solidify, to outline the educational needs and suggest ways of insuring that the hospital has optimum teaching value.

Establish educational roles

Educational philosophies and methods vary from school to school, and in determining what facilities are most needed or most appropriate, each *VA* hospital must be considered as a separate case. The need for providing within the hospital certain types of educational facilities designed to serve both school and hospital jointly can be determined *only* by analyzing the local situation. Implicit in this is the need to analyze the educational resources and needs of the total medical center, and the entire community.

Each hospital a different case

The early programming of educational needs, besides clarifying space requirements, will have other benefits, the most important of which are these:

1. It will eliminate guesswork and conjecture as to the nature of educational activities to be provided for, by requiring that the objectives, policies and program of the school be clarified.
2. It will encourage long term rather than shortsighted planning, and will minimize the likelihood of overlooking essentials.
3. By expanding the scope of mutual interest and responsibility, it will also increase the benefits of affiliation.
4. It will help bring into proper balance the triad of hospital functions — patient care, research, and education.
5. It will help extend the educational resources and opportunities of the entire region.

Benefits of defining educational needs early

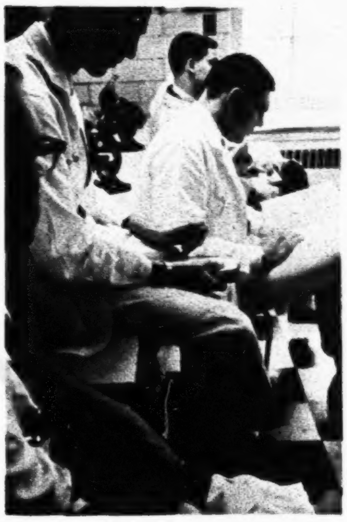
It is recommended that in the early survey and exploratory stage of any new *VA* hospital, the Dean of the medical school with which it is to be affiliated be requested to provide a statement outlining in general terms the educational policies of the school and explaining how its program is expected to relate to the use of hospital facilities.

Early role for the Dean's Committee

After the Dean's Committee is appointed, that body should be asked to provide a more detailed functional program which can be given full consideration in developing the Master Plan for the hospital. During the process of this development, designated members of the Dean's Committee should have a respected voice in planning decisions affecting the support of educational functions of the hospital.

Provision of Adequate Space

Minimum space handicaps education



The necessity of maximum efficiency in the planning of *VA* hospitals is recognized and heartily endorsed, but overemphasis on reduction of space for the sake of lower cost will handicap any educational program, and is a particularly serious obstacle to clinical education. One reason for this is that more and more persons and skills are becoming necessary in hospital care, and consequently in the supporting teaching and training programs. More medical students are becoming involved with patient care earlier in their training, and more students are being brought into the hospital as a result of expanding the medical school curricula in the area of clinical subjects. Another reason is that clinical education, being focused on the patient, is more intimate and personal in nature, involving for the most part, small, informal groups, and for obvious reasons does not lend itself to strict scheduling of space requirements. Still another fundamental reason is the need for individual identity, not only among the teaching staff but among residents, students and trainees. The residents must have office space, and every student and trainee assigned to the hospital should have a quiet work-study area he can call his own. It is obvious, therefore, that the space allotted to the educational functions of the hospital must be adequate; it must *not* be minimized.

Teaching hospitals require more space

Any teaching hospital requires more space than a non-teaching hospital with the same number of beds. Just how much more is debatable; it depends to some extent, of course, on the nature of the hospital and the depth and scope of its teaching program. In some university hospitals, it may require an increase of as much as 35 to 40%,* but it is very doubtful that the scope of teaching and training considered appropriate in *VA* hospitals would involve, even on the most generous basis, an increase of half this amount. As examples, the two case study programs presented later are estimated to require a net increase in overall area averaging about 10%.

Three types of facilities required

Three general types of educational facilities are recommended in this report: those planned to serve 1) the entire hospital, 2) a service, floor or department, and 3) the nursing unit. It will be seen that the area needed for those in the last category is rather easily determined, and would probably add about 13% to the net area of the average 40-bed nursing unit. The amount of additional space needed for facilities of the second type is not as easily identified because their number and size are directly related to the total planning concept of the hospital. Finally, the increment of space chargeable to hospital-wide educational facilities will vary widely from one station to another. In some cases, adequate facilities of this nature may be conveniently available at the affiliated school, and the space needed for them in the hospital will be minimal; at other stations, it may be advisable for the hospital to provide them, and they will add substantially to the total net area.

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* The order of increase estimated in "Medical Educational Facilities," a report by the U.S. Department of Health, Education and Welfare, 1964.

Economy of space a guiding principle

Economy of space requirements has been a guiding principle in the development of all recommendations presented in this report. Only such functions as are thought to be essential have been proposed, and a consistent effort has been made to use space as efficiently as possible in the design studies which follow. Consequently, the recommendations are felt to represent the appropriate *minimum* that should be provided to support an educational program. These spaces will be adequate, at least in the foreseeable future, but to reduce them would seriously diminish their value.

Recognition of Changing Needs

If there is one thing that is certain about educational methods in general, and the techniques of clinical education in particular, it is that they are subject to change, and that changes will continue, perhaps even accelerate. Many of these changes significantly affect space requirements.

Many factors contribute to change

Innovations in teaching methods are not the only factor, however, which necessitates periodic changes in clinical educational facilities. From time to time, curricula are reorganized; the educational program is expanded to include new subjects or is revised to keep it in proper balance with the research program of the hospital; new specialties emerge, calling for new kinds of specialized training, and new types of equipment are brought into use, requiring special facilities, or new skills, or both. All of these are factors contributing inevitably to changing requirements of space, and although it's impossible to foretell the nature of many of these changes, they should be anticipated in planning. This situation is by no means unique in medical education; a prime concern in all fields of education today is planning to accommodate changing needs.

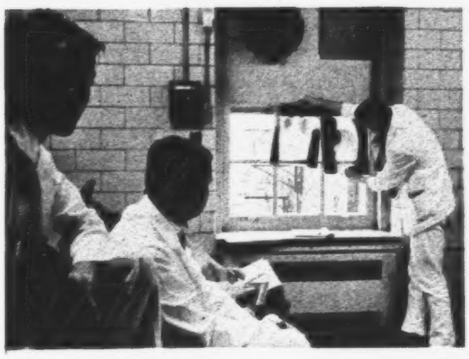
Plan for probable change

Within the limits of economic feasibility there is no completely satisfactory solution to this problem. It would obviously be impractical to provide sufficient standby space to meet all possible future requirements. But it is even more unrealistic to take the opposite view that since changes cannot be predicted with accuracy, only present needs should be considered. A middle course is advisable, planning as generously as possible, with the probability of change in mind, and providing for it as well as possible.

Principles when planning for change

The important principles to be observed, in planning for change, are these:

- Planned *convertibility* from one use to another is better than simply providing flexibility for no specific reason.
- Multi-use of space, if it is planned to serve specific functions and it serves those functions well, is generally desirable.
- Provision of a wide variety of learning spaces, varying from small interview rooms to large teaching rooms, permits a more efficient and versatile use of space than undertaking to provide large spaces which are subdivisible according to need.
- Over-emphasis on rigid economy of space is, in many cases, a serious handicap to changing need, often necessitating later changes far exceeding in cost the original saving.
- Wherever possible, likely changes should be anticipated in the original planning, and the order of their accomplishment should be established. Also, if possible, budgetary provision should be made for them.



Unplanned space poor

It must be recognized that "flexibility", in one sense of the word, may be overdone by simply providing unplanned, blank space. This is generally worse than rigid planning; it is, in fact, *the lack of planning*. This kind of space can too easily be usurped for unplanned and undeserving uses, and too often it has been this kind of nondescript and nonfunctional space that has been allotted to "classroom" use in hospitals. Proper facilities for education are *not* simply a certain amount of space; if they are to fulfill their purpose, they must have their own special character, and the nature of the room varies with the specific educational function to be served.

Providing for change is essentially an attitude in planning. Certainly an appreciation of its importance is essential; if nothing more, it will minimize the likelihood of "building out" the possibility of making the inevitable future changes.

Environmental Factors

Hospital provides many environmental conditions

Fortunately, hospital planners are keenly aware of the need for controlling the environment, and a wide range of environmental conditions is normally provided in different areas of the building. It should pose no problem, therefore, to provide in the teaching spaces the best possible conditions for educational purposes. These requirements are not unique or very exceptional, but they do differ in some respects from those of typical hospital rooms. A brief discussion of the principal considerations in respect to lighting, acoustics and atmospheric control is, therefore, in order. Obviously, proper provision for all of these should be made in the early planning stage; they are *not* afterthought improvements to be added later.

Place of daylighting

a. Lighting: The degree to which any of the instructional spaces, and especially the larger ones, successfully fulfills its function will depend to a large extent on how it is lighted. Daylighting will occur in some of the rooms; most likely the smaller conference, seminar and classrooms will have windows. The larger teaching rooms would usually be inside rooms and windowless; this would be preferable because the presence of windows can hamper the use of projected media and specialized teaching aids. In any case, since daylighting is an unknown factor, the concern in this discussion will be with artificial lighting.

Inappropriate lighting in most "classrooms"

Among the most serious deficiences of the "classroom" spaces typically provided in hospitals is the quality of lighting and the inconvenience of controlling it. For instance, to see projected images clearly, the ambient light on the screen must be reduced, and this necessitates darkening of the room. If there are windows — and there usually are — the window shades must be lowered, or special blinds may have to be installed, and the lights must be turned off. Then the room becomes too dark to take notes. Usually the light switch is located at some distance from the instructor, and very seldom, if ever, are there provisions for intermediate levels of lighting appropriate for the various media and instructional situations.

Two task surfaces of equal brightness

In any space, whether conference-seminar room, classroom, or still larger "teaching room", it is essential that there be a comfortable level of lighting for taking notes *during* the use of any visual media. At such times there are two principal "task surfaces", both of which should *invite* the student's attention:

— the projected image (or perhaps several simultaneous images),
— the tablet surface (table top or writing surface)

While these surfaces are in use, no other area or object in the room should be lighted prominently enough to compete for attention. These two task surfaces should be ideally of about equal brightness, and all other surfaces within the room should be less bright, but not less than 1/10 as bright.

At times though, certain other areas will require greater illumination, as attention is directed to them. These include:

— a patient, being treated or demonstrated
— models, mannequins, equipment and apparatus
— wall charts and displays
— the teacher himself

Other areas require special lighting

The area where the patient will be demonstrated before a group or class should always be well lighted from above, with the lighting controls easily available to the instructor, and when chalkboards or other display surfaces are used, they also should have their own easily controlled illumination. When not in use, such surfaces should blend inconspicuously with the general background. When the instructor becomes the center of interest, as during discussion periods, and images are not being projected, the general level of illumination should be raised, but the lighting should focus interest on him.

The apparent screen brightness of any projected image is determined by a number of factors:

- The projection medium — slide, film, overhead transparency, etc.
- The efficiency of the projection equipment
- The projection distance
- The type of screen
- The amount of ambient light falling on the screen
- The location of the viewer

Screen brightness as lighting reference point

This apparent screen brightness automatically becomes the reference point in determining other levels of illumination within the room. In the larger instructional rooms, for the use of a variety of media with lighting keyed to their respective brightnesses, there should be not less than three levels of lighting available for both task surfaces and background illumination. It is of utmost importance that directional lighting be used so that a minimum of light falls on projection screens and bright spots are not reflected by TV receivers.

Preset lighting controls

Control of the lighting should always be in the hands of the instructor, but the arbitrary selection of the proper level for each viewing condition should *not* be his privilege. Instructors' preferences vary, and often it isn't possible to determine from his station what level of lighting best serves the audience. Appropriate lighting levels, at least in the larger rooms, should be predetermined and pre-set and the instructor's control should extend only to the selection of sequence and duration.

Methods of special lighting

In the smaller rooms, sufficient lighting of walls and ceiling will automatically be provided by spill from the "working light" sources, but in the larger teaching rooms, special lighting of those surfaces, at variable levels as indicated, should be provided. The instructor's station in the larger rooms will probably be locally lighted by two or more concealed spots in the ceiling, not directly overhead, but at sufficient angle to avoid grotesque shadows on his face. Chalkboard and display lighting may also be provided by ceiling-mounted directional fixtures, or by inconspicuous trough lighting mounted on brackets projecting about 18″ out from the top of the surface to be lighted. Areas where either a patient, models, apparatus, equipment, or experiments will be demonstrated require carefully designed special illumination; the lighting problem here is closely related to that of stage lighting.

In connection with the design studies presented later in this report, additional information regarding lighting is included with the design data for those facility types where lighting is unique.

Importance of initial design

b. Acoustics: Good conditions for hearing can be just as important as is proper lighting, and as with lighting, the acoustical properties should be designed into the spaces initially, rather than having to be added later as a corrective measure. Just as with lighting, too, the importance of the acoustical properties are generally proportional to the size of the room.

Generally, architectural acoustics is concerned with two objectives:

Two acoustical considerations

1. The provision of satisfactory acoustical environment by the *isolation* of sound; raising barriers to unwanted sound (noise) to prevent its passage from one space to another by the *transmission* of sound waves through materials or open spaces, and
2. The provision of good hearing conditions, by controlling the direction, impact and duration of sound waves within a given space. This is a function of the *absorption* and *reflection* characteristics of the materials lining the space.

The first objective is a matter of concern in rooms of any size, where quiet and privacy are required; the second generally becomes a concern only in larger rooms, where audibility is important.

Properties of good sound barriers

Sound isolation depends largely on the construction of the walls, floor and ceiling enclosing a space, but may also be affected by equipment within the rooms. The construction of partitions, in particular, is a critical factor. Any openings in the construction of an intended sound barrier are leaks, which have the same significance as the leaks in a pair of rubber gloves. Any true barrier to sound transmission must be air-tight. Besides complete continuity, the other essential properties of a good sound barrier are mass and inertia. Weight alone is not enough; stiffness, too, is an important factor. The best barriers are those which are *not* stiff, but limp — yet heavy.

Flexible partitions

Along with the current interest in "flexible spaces" has developed a growing interest in flexible partitions and space dividers, and their generally deficient performance as sound barriers has served to highlight these basic laws of physics. It is not impossible, however, to achieve privacy with flexible partitions, and some of the newer types, which carefully observe these principles, perform satisfactorily.

Overall noise level

Another consideration in acoustical isolation is the effect of the background sound level. A high level of continuous background sound, such as may be experienced in office areas, serves to mask out minor acoustical intrusions which might be annoying in more quiet surroundings. In hospitals, however, the background noise level is generally low; consequently, the barrier value of the surrounding constructions is critical in areas where privacy or quiet are essential.

Small rooms soundproofed

Sound isolation is desirable for all of the educational spaces but standard hospital construction should serve adequately in most cases. It is particularly critical, however, for small conference and interview rooms and for examination-treatment rooms — those areas in which personal matters are discussed and confidential information is divulged. Where folding partitions are used to divide group therapy rooms, or between an examination-treatment room and a conference room, they should be of superior quality, with a decibel rating of not less than 40.

Problems in the larger rooms

Other problems of isolation will require attention in the larger teaching rooms. These rooms will require mechanical ventilation or air-conditioning, and careful attention must be paid to the arrangement of ducts and plenums to eliminate acoustical leaks, to insure against acoustical "short circuits" between rooms. Mechanized projection equipment within rooms may also be the source of objectionable noise, requiring some form of sound isolation. Booths for front projection should be completely enclosed with a glass panel in front of the projectors. With rear projection, the typical flexible screen provides an inadequate sound barrier and should be supplemented by glass sealed in a continuous frame.

Quality of sound within the room

The sound absorption and reflection characteristics of materials within the room, as well as the size and shape of the room, determine the quality of hearing sounds originating within the room itself. Hard, dense materials absorb very little sound, reflecting nearly all of the sound waves striking them, while soft, porous materials act oppositely, absorbing a large portion and reflecting little. When large areas of porous materials such as carpet, upholstered furniture and special acoustical tiles and blankets are placed within a room, the reflected energy is greatly reduced, sound is largely absorbed and dies away quickly, and the "reverberation period" of the room is considered to be low. If, on the other hand, the surfaces lining the room are hard and therefore highly reflective, sound waves are bounced back and forth many times before they die out, and a long reverberation period results. This is the ringing and echoing condition commonly experienced in empty and unfurnished rooms.

Location of reflective and absorptive surfaces

The objective, in designing for good hearing, is to locate the reflective and absorptive materials within the room in order that all occupants will receive nearly the same agreeable volume of sound, and no one will receive perceptibly delayed repetitions. This means that, in general, the surfaces relatively close to the sound source should be reflective, to amplify and disperse the original sound. Surfaces behind the audience and facing the sound source should be made absorptive, to minimize the rebound of sound energy, causing delayed repetition of the first hearing. As a rule, ceiling surfaces should be of hard reflective material and should be flat planes. Non-parallel side walls improve the dispersion of sound and so tend to reduce the reverberation period.

Use of a sounding board

The larger spaces for 60 or more persons require the most careful attention, both as to room shape and disposition of surfacing materials, if optimum hearing conditions are to result; otherwise, reverberation, distribution, and volume may become problems. It is in these larger rooms that the conformation and reflective quality of the ceiling are especially important. Provision, in effect, of an inclined "sounding board" surface over the instructor's area, to reinforce and disperse the normal speaking voice is advisable and, in most cases, this can be provided by the conformation of the ceiling itself. The remainder of the ceiling may be treated as a series of flat, reflective, off-set planes and the rear wall should always be faced with highly absorptive material.

Providing for recorded sound

Under normal circumstances, no artificial amplification system should be necessary in any of the rooms proposed in this study, if the recommendations as to room shape and acoustical treatment are followed. The one exception may be the teaching auditorium of over 300 capacity. Much of the teaching in these rooms, however, will employ electronically produced sounds, and the distribution of "piped" sound must be provided for in their designs. The use of a central high level system with the speaker located in the central upper part of the front wall is often preferred.

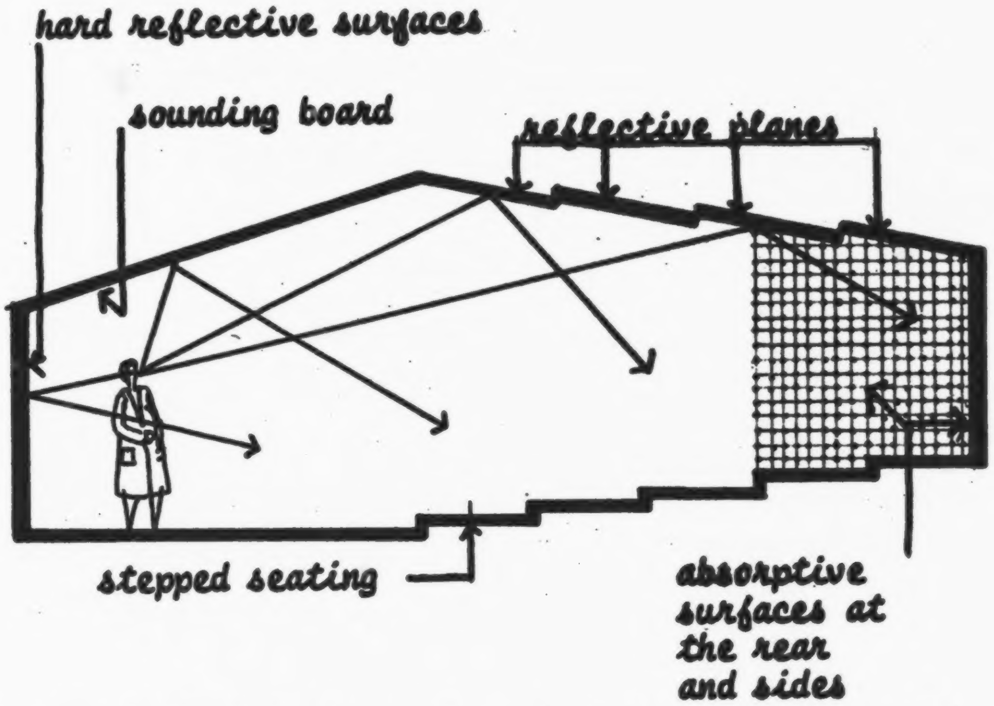


Figure 2. The basic elements for proper acoustics within a teaching room include hard surfaces at the front, sounding board and reflective planes in the ceiling, and absorptive material at rear and side walls.

Climate conducive to learning

c. Climate Control: Too frequently, in the design of classrooms and teaching spaces, insufficient attention is given to providing a physical climate *conducive* to learning. The problem is not simply that of providing comfort, but of creating an atmosphere in which the students are alert and attentive. Not only must temperatures and humidity be held within close limits, but air movement, too, is an important factor. Without producing noticeable drafts, sufficient circulation should be provided over the surface of the body to carry away the layer of hot, moist air which tends to form next to the skin.

In general, the climate conditioning of the educational spaces will involve no unique technical problems, but in the large teaching rooms there are several matters which will deserve careful attention and consideration by the designer of the system:

Special factors in the large rooms

1. The number of occupants per unit volume will be relatively large.
2. A good deal of electrical heat-producing equipment and lighting will be used at times.
3. Good hearing conditions within the rooms are mandatory, necessitating special care in the selection and installation of fans and ductwork, to minimize noise and prevent sound being carried from room to room.

Necessity for cooling

Obviously, the amount of heat generated within the larger teaching rooms will vary widely, ranging from zero when they are not in use to maximum when fully occupied and lighting and equipment are in operation. The dominant temperature control requirement will probably be cooling rather than heating, even in winter, in most cases. Furthermore, the usage pattern for these spaces may be quite irregular. Thus, the fluctuating demand on the air conditioning system, to maintain optimum conditions when the room *is* in use may well require individual control systems for these spaces. Also, if smoking is permitted this will require the use of some effective means of controlling odor and removing dust particles.

Locations of outlets and returns

It will probably be found that optimum air distribution within the larger spaces can be accomplished by use of ceiling diffusers. Since a large portion of the floor area in these rooms will be occupied by seating, outlets located at low level would produce uncomfortable drafts, particularly when delivering cool air. Return air grilles should be located so that the air flow is reasonably uniform over the occupied area, preferably at low sidewall locations or under the seats.

Providing Communication Systems for Education

Systems for communication

The process of teaching and learning involves systems of communication which are an integral part of the hospital plant. The purpose here is to review briefly the various types of communication systems, most of which are already available and commonly in use, with particular emphasis on their potentials in the educational processes of the *VA* hospital for teaching. Finally, consideration will be given to providing for them when planning.

Types of audio systems

a. *Audio Systems:* Audio communication systems have long been a standard feature of hospitals. These include the patient-nurse intercom, the paging system, telephone and radio systems, and sometimes central dictating systems, and even piped music. But seldom has the potential value of such systems for educational purposes been fully realized, or even explored.

Functions for care and teaching

Communication systems are essential not only for good patient care, but for bedside teaching as they enable the patient, the doctor-teacher, and the student-trainee to talk together and with persons at other points throughout the hospital. They bring care in the form of personnel, drugs, and equipment; establish times for taking the patient to diagnostic and treatment facilities, and simplify administrative procedures. They also marshal the proper people, information and resources for teaching.

System to include educational facilities

Audio systems may eventually be used to recall information centrally stored on tapes and records. This is one of the more sophisticated aspects of communication and suggests that the audio communication system be extended into teaching rooms, treatment rooms, conference rooms, residents' offices, student home bases, and other instructional facilities. In this way, the resources available at the bedside can also be made available in every other teaching situation in the hospital.

Current and future potential for video systems

b. *Video Systems:* Various systems of visual communication are also commonly used in hospitals. The use of slides and films for communicating information on patients and for instructional purposes is common practice. And in recent years, the use of closed circuit TV has been used for patient monitoring and for observation of interviews and group therapy. Again, the full potential of such systems as aids to education is not being realized. X-ray films and medical records can be miniaturized for ready reference in patient care or for showing to groups of students. Perhaps most important of all will be the role of some form of miniaturized materials in helping to solve the mushrooming problem of information storage and retrieval. These are only some of the developing functions of the video communication systems in medical care and education.

TV least understood

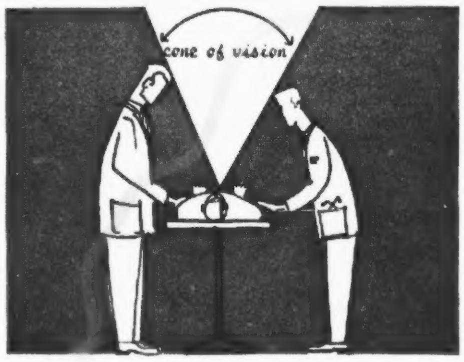
c. *Audio-Video Systems:* The common forms of audio-video communication include the narrated film loop, the sound slide, the sound motion picture, and television. The first have obvious educational merits and some application in patient care, but the values of television as a communication system are less widely known and probably more debatable.

Limitations and potentials of TV

The limitations of television as a complete communication system are no longer technical; they exist only in the attitude and imagination — and the financial resources — of the user. The technical problems have been solved to make functionally available a TV system which will bring "live" to any point in the hospital a picture and sound originating anywhere in the hospital, or in the *VA* system, or in the world. This capability brings unlimited resources to the bedside, to the classroom and laboratory, to the seminar room, or even to the students' carrel. In less dramatic and expensive ways, TV can be a most valuable aid to both education and patient care:

Extending patient care and learning experiences

1. Television can be used to distribute nursing care more widely by letting one nurse watch over a larger number of patients, but it can also concentrate more nursing care on a few patients. Both for patient care and training, the ability to let the nurse and student see into more patient areas, or more of them into one patient area, is highly significant.
2. The perimeter observation gallery or amphitheater is not satisfactory for viewing surgery, if the intent is to observe technique, rather than simply a surgical environment. The viewer's eye must be in the "cone of view" and even then magnification will usually be required. In *VA* hospitals the space required for this type of observation can better be used in other ways. One or more television cameras mounted over the operating table, with remote zoom lenses, is a logical alternate solution. With a closed circuit system, any instructional space in the hospital becomes a gallery, with as few or as many observers as desired, and each viewer sees as detailed a view as the operating surgeon himself.



Observing surgery

Observing specialized treatment

3. Television can also be effectively employed in diagnostic and treatment procedures which require specialized equipment with a limited field of vision. For instance, in endoscopy, each person watching the TV receiver becomes the viewer at the lens of the endoscope, and in radiology, each person has a better view than from the lead-shielded room. With a closed circuit system, observation may take place in any appropriate facility throughout the hospital, and by any size group, regardless of the type of learning situation.

Observing patient behavior

4. The use of television permits an observer to see all the persons in a group without his physical presence being a deterrent to their activity. This is particularly appropriate for psychiatry, and is an improvement over the one-way mirror, is it permits as large a group as desired to be located in any instructional space in the hospital for viewing. By simply providing the terminal jack for receiving a camera, practically any room can become a studio in which patients can be observed.

As a distribution system for visual information

5. In many instructional situations in clinical teaching, it is desirable to have available visual materials which clarify and amplify the subject under discussion. These materials may be in a variety of forms — charts, photographs, diagrams, slides, x-rays, EKG and EEG graphs, or patient records — and from their point of origin or storage, they can be distributed to any instructional point in the hospital by a television system. Thus television can become the distribution system for all the information throughout the hospital, and it is towards this final, sophisticated goal that a television system should be developed.

As a means of magnification

6. In the larger teaching rooms, television can play an important role as a means of magnification within the room. The television camera under the control of the instructor can be used to magnify physical details of the patient being demonstrated, or graphic materials and microscopic slides, enabling the group in the room to see all the necessary detail. With such a system, the image may be displayed on receivers or may be projected on a screen.

TV as a total system

In any teaching hospital, it is logical that television be considered as a *total* communication system. By master planning a system involving compatible components, economical television facilities can be installed initially to do one or two basic instructional tasks, and can later be expanded as the medium's effectiveness is proven and as new tasks are assigned to it.

Future uses for color TV

Admittedly, the observation of certain surgical and diagnostic procedures cannot employ television effectively until an economical color system is available. However, there is no doubt that within the life span of any hospital built today, and probably within the life span of most hospitals now existing, economical color television *will* become available, and TV will then assume these additional functions. It is important to realize that a closed circuit black and white television system installed today can be converted to color distribution at a later date by modifying the terminal equipment, if the initial installation is conceived with the eventuality of using color.

Three-dimensional information

d. *Mechanical Systems:* Pneumatic tube systems, conveyors, and lifts may also be considered as communication systems, inasmuch as they may move information in three-dimensional forms from place to place. Movement of records, charts, specimens, slides, and films are necessary not only for patient care, but for supporting teaching and training. Their role in these latter functions should be carefully studied when planning their initial installations.

Alterations costly

The importance of thoughtful consideration *during the planning* of communication systems of all possible future applications cannot be overemphasized. It costs relatively little to provide conduits, raceways and ducts for communication facilities during the construction of a hospital, but the cost of making alterations to finished buildings in order to install them later is always high, to say nothing of the inconveniences involved. The problems posed by the latter alternative may be sufficient to discourage its undertaking.

Providing for future usage

Even when budgetary limitations preclude the immediate prospects of using such communication facilities as TV to the fullest extent for instructional purposes, patient care, or research, conduits and raceways should be provided for its *future* use, and arrangements should be made so that these can easily be extended wherever and whenever desired with a minimum of difficulty and inconvenience. With the rapid developments in TV, and prospects of low cost color, there's little doubt that eventually all such facilities will be used.

Planning for the Utilization of Instructional Media

Extending the value of the patient

Although the patient will necessarily continue to be the major resource in clinical teaching, the use of other teaching media and instructional aids is constantly increasing. Live and taped television, as well as films and audio tapes are being used to extend the patient, as a source of information, to more students with more effectiveness. More aids such as slides, transparencies, models and mannequins are becoming essential to the teaching process. No longer are the sources of learning limited to the patient, the book and the teacher's voice; now they have become practically limitless.

Appropriate use requires appropriate rooms

The value of all these media as pedagogical tools depends largely on how well their use is organized and how effectively they are displayed. They lose much of their effectiveness if they're employed incidentally and in random fashion, or if they are used in surroundings not appropriate for the purpose. The potential value of media when used to their fullest advantage in spaces specifically designed for such use, has as yet too rarely been realized.

Aids and media as parts of a system

The *systems concept* as applied to the use of aids and media, is simply the concept that every item being used, whether film, slides, overhead transparencies, the chalkboard or any other, should be used appropriately, and should be carefully planned to produce the most effective overall presentation. In this concept, the screen, the projector, and the chalkboard are *not* thought of as separate items of hardware, nor is the teacher himself necessarily a separate identity; all are components of an integrated whole. This is the ideal to strive for wherever media is being used, and in some areas of education, it is already being achieved with remarkable results.

Organization of the instructional material, like the scope of instructional resources, can be improved with time. But the proper character of the spaces in which the aids and media are to be used cannot easily be rectified later. Space should be properly planned and built from the start; otherwise, there may be built-in handicaps to effective teaching. Careful attention should be paid to the optimum use of aids and media, as has been done in the designs developed in this study.

Facilities planned for media

When considering the use of instructional media in clinical medical education, some thought has been given to the reasons they are not used more extensively at the present time. Some of the reasons seem to be:

1. Most doctor-teachers are not aware of the developments and potentials of the aids and media.
2. Many doctor-teachers have no formal training as teachers and are not primarily concerned with pedagogy; they teach as they themselves have been taught.
3. In most hospitals, there is a lack of instructional support, and when money becomes available the demands on it are greater for other things than for equipment, staff or materials to improve the teaching process. What equipment is available is usually old, complicated and unreliable.

Deterrents to the use of instructional aids and media

4. Such instructional facilities as are provided in hospitals are seldom designed with the use of instructional aids in mind. To be most effective, the use of instructional aids and media must take place in an appropriate environment.
5. There are usually problems of time and effort involved in obtaining necessary instructional materials. The department or services may be located in several places and neither the form nor the quality of the material is consistent. Most busy doctor-teachers cannot afford the time and frustrations involved in gathering together all the related instructional aids.

Removing these deterrents

It is the purpose of this study to aid in eliminating some of these deterrents. Because of this report perhaps more doctor-teachers will be informed, but it's very doubtful that established convictions or habits will be altered. Also, this study can only demonstrate and urge the desirability of allocating adequate funds for instructional support. The fourth item, however, is one of the prime targets of the study, and the design studies and planning information have been developed as an aid in removing this handicap. In reference to the fifth item, it must be recognized that, whatever facilities are provided, the resources of the hospital must be so organized that instructional materials are coordinated and made readily available. This has important implications for not only the organization of the library and the medical illustration department, but also the medical records, pathology, and radiology departments.

Organization of the Learning Resources

All hospitals are producing, as a matter of routine procedure, various types of information and data that are useful as teaching material. It's doubtful though, that the significance of some of these learning resources, and the importance of making them more readily available as such, has been fully recognized.

Problems of assembling resources

Learning resources are presently produced and stored in many locations within a variety of autonomous departments, and are often inaccessible for instruction and learning. Typically, there has been no real concern, in the general planning of the hospital, with the production and storage of learning resources. The result has been that the inconvenience and time involved in assembling materials from a variety of departments for instructional uses soon defeats any enthusiasm the instructor may have for expanding or improving his instructional techniques. Because it is advantageous to organize learning resources so that they may be used by doctor-teacher, student, and trainee, the following points should be considered when planning the hospital:

Relate departments physically

1. The departments which produce and store learning resources should be planned to be in close physical proximity to facilitate assembling resources conveniently and quickly.

Expand medical illustrations

2. The medical illustration department should be expanded to provide for the presentation of information in a variety of different forms through varied production techniques. For example, the technical staff servicing the use of television should be physically and administratively a part of this expanded section.

Expand the library

3. The medical library should be thought of as more than simply a repository of books and printed materials. In addition to housing these, it must also become the place where all kinds of learning resources are received, indexed, stored, and retrieved for use both within the library and throughout the hospital.

Develop resource sub-centers

4. Learning resources should be readily available within a service as well as centrally in the medical library. The departmental resource subcenter should be more specialized and not as extensive as the medical library, yet should make available its resources in a variety of forms.

Extend communication systems

5. Communications systems should be incorporated which will make appropriate resources available at every teaching point within the hospital, and eventually within the entire *VA* system.

Importance of personal attitudes

Design studies and planning information for specific facilities which implement these philosophies are discussed later, yet space organization alone will not insure the accomplishment of the goals outlined here. Equally important is the development of appropriate attitudes on the part of all concerned. The chiefs, assistants, and all others associated with the departments inolved must be cognizant of, and interested in, the fact that they are engaged in supporting the instructional process, *as well as* playing an important role in providing patient care. Also important is the development of the attitude, both on the part of the library staff and of the users, that the library—the Resource Center — is a source of information not only in printed form but in *many* forms, and that this information is ready for use in a variety of ways. The development of such attitudes will provide encouragement and assistance to both teacher and student in the never-ending quest for knowledge.

2. HOSPITAL-WIDE FACILITIES

Introduction

Not all educational activities related to nursing units and services

The majority of learning experiences in a *VA* hospital for teaching occur individually or in small groups; at the bedside, in laboratories, in conference rooms, in teaching and demonstration rooms, at therapy sessions, and otherwise in "working" situations. These experiences and their appropriate facilities will be discussed in the following sections as each relates to the nursing unit, nursing floor or service. But there are also needed certain types of educational facilities which serve the hospital as a whole.

Types of hospital-wide facilities

There are certain learning experiences, for example, which occur in large groups, bringing persons together from all over the hospital. For such situations, a large teaching room or access to a teaching auditorium is needed. Also, the various teaching-learning processes throughout the hospital must be supported and reinforced in two ways. First, instructional and learning resources must be readily available to both learners and teachers, and this requires library-type facilities, — a learning resources center. Secondly, facilities are needed for the production of these instructional materials and the provision of general pedagogical support for the teaching staff. And other, less formal, educational facilities which have hospital-wide usage include museum and exhibition areas, seminar-dining facilities, and a home-environment demonstration suite.

Importance of relationships

Each of these hospital-wide facilities for education will be discussed and described in this section. Just as the various members of the health-care team should function together as a system, so the educational facilities in a *VA* hospital are interrelated functionally and should be considered as a system. In these discussions, therefore, emphasis will be placed on the relationship of these facilities among themselves and to the other educational facilities of the hospital.

The Large Teaching Room

Functions of the large teaching room

There are many occasions when the medical staff, personnel and students of two or more services come together, — occasions such as conjoint teaching rounds, unusual case presentations and demonstrations, lectures, colloquia, staff and personnel meetings, and interdisciplinary health-science training sessions. And often the personnel service of a *VA* hospital requires space where large numbers of *VA* personnel may be assembled periodically for in-service training, or where *VA* personnel from other hospitals in the region may meet for one or a series of sessions. Furthermore, with the trend toward integrated basic and clinical science curricula, the *VA* hospital should provide a place in which the entire class of an affiliated medical school may meet for lectures and demonstrations. Finally, an appropriate teaching facility for the continuing education program involving practitioners and health-science personnel in the community or area should be a part of the *VA* hospital system of facilities.

Service-related teaching room usually not large enough

The service-oriented room discussed later may accommodate some of these functions, but generally it is not large enough for most of them, and while it is located conveniently for the use by a particular service, it will not be conveniently located for the functions just mentioned.

H-1 describes the large teaching room

A large teaching room for hospital-wide usage is therefore essential, and such a room, designated as facility H-1, is defined and described on the following four pages. Note that the room is conceived as a teaching room, with appropriate seating, the availability of a wide variety of instructional aids and media, special considerations for the position of the teacher and his use of lighting and equipment controls, and with adjoining space to support the demonstration of patients and the preparation of instructional equipment and materials.

The Educational Auditorium

Availability of an auditorium for teaching important

The necessity for providing an auditorium in a *VA* hospital for teaching will depend upon the proximity of the *VA* hospital to other elements of the medical center and the availability of educational auditorium facilities elsewhere within the medical center. For a complete system of educational facilities, a large educational auditorium must be available, but it may be located elsewhere in the medical center provided it is physically convenient for staff, students, and teachers, and that it is possible for patients to be brought in for recreational purposes, as well as for demonstration-teaching purposes.

Size will vary

Obviously the size of the educational auditorium will vary with the size of the hospital, the type of educational program, the type of affiliation, and the needs imposed by other functions such as patient recreation and entertainment. Usually it will have a capacity of 300 persons or more.

Importance of continuing education

The concept and functions of the educational auditorium are defined, and an illustrative example of such a facility, designated as H-2, is presented on the pages following. One of the important uses of such a facility would be for continuing education, which is of great and growing importance in the *VA* system and throughout medical education. In this connection it would be used for conferences and meetings of professional societies, short courses, special conferences and training sessions, and a host of other educational activities which involve the medical community. The provision of such an auditorium with its continuing education potential will greatly enhance the status of the *VA* hospital in its professional community.

Auditorium can be a shared facility

Necessarily, the programming of an educational auditorium must take into account the large group facilities available throughout the entire medical center, because such a facility should be planned to serve the common need. If the common need exists, the *VA* hospital has an excellent opportunity to demonstrate its cooperation by providing it, but if appropriate and accessible auditorium facilities are already available elsewhere, it may provide instead such other center-wide needs as a resource center or a production unit.

The Learning Resources Center

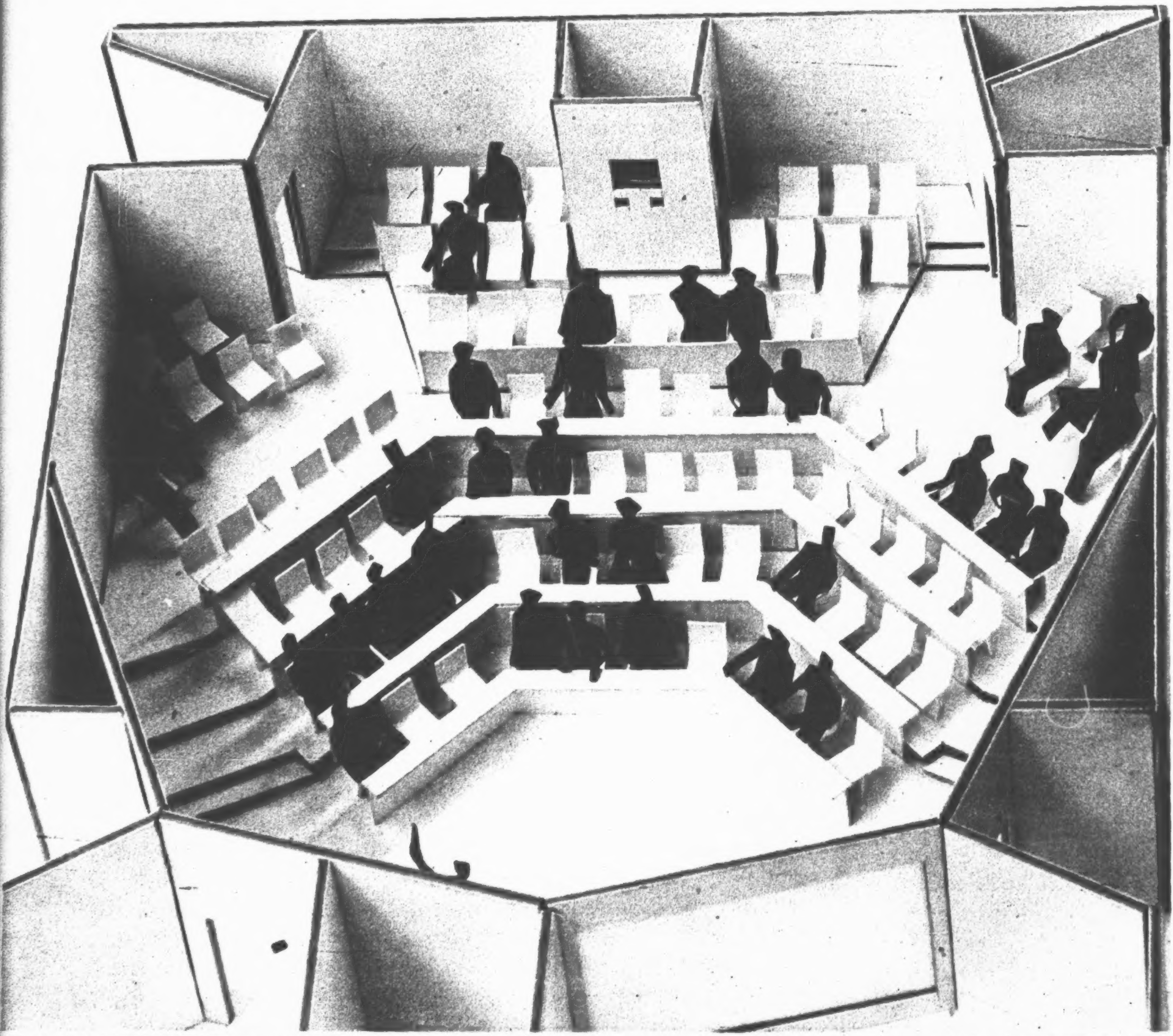
Medical library with new roles and new facilities

It is generally accepted that the patient is no longer the only teaching aid in clinical medical education, nor is the printed word the only instructional media. Both are still prime essentials, but to them have been added a whole range of additional aids and media which have been discussed previously. All of these aids and media play a role in the educational processes of a teaching hospital and all of them must be made readily available and accessible to teacher, student, and practitioner. The hospital-wide Learning Resources Center, as proposed here, is such a facility. It coordinates the accession, the storage, the indexing, the retrieval, the usage, and the restorage of all these learning resources. It is the medical library of the past with new roles, new functions, new materials, and new concepts for facilities.

Planning begins with review of total access potential

As with the educational auditorium, the planning of the Learning Resources Center in a *VA* hospital begins with a review of the accessibility of resources throughout the entire medical center. If the *VA* hospital is in close physical proximity to a medical school or other institution which contains an extensive and complete resources center and which can be made available to students and teachers on a generous time basis, then there is no need for duplicating these facilities in the *VA* hospital. In this case, the resources center in the *VA* hospital would be more a "using" space than a storage space, and a sub-center to the larger existing facility.

H-1
LARGE TEACHING ROOM



PHOTOGRAPH OF MODEL

H-1

LARGE TEACHING ROOM

PURPOSE:

To provide an instructional environment for hospital-wide use which will combine all important considerations for making large group learning effective, as well as efficient.

PRINCIPAL USES:

- joint teaching functions (two or more services)
  - — rounds and case presentations
  - — lectures and demonstrations
  - — colloquia
- hospital-wide functions
  - — personnel training
  - — in-service training
  - — guest speakers and lecturers
  - — continuing education programs
- teaching total classes from the medical school
- patient recreation

USERS:

- all students, trainees, staff, and personnel of the hospital
- full classes of medical school students
- health personnel from the community
- students staff and trainees from affiliated schools
- patients

QUANTITY:

One for each hospital.

SPACE REQUIREMENTS:

- accommodate 100 to 200 persons depending on the size extent and involvement of education and training programs
- permit bed patient to be brought in and positioned with any necessary apparatus for optimum viewing by the group
- allow various pieces of equipment and apparatus to be brought in and demonstrated
- adjunct spaces —
  - — projection and storage area — space for housing and readying rear projection equipment
  - — patient preparation area — space for readying and holding patients used in demonstrations and presentations

SIZE:

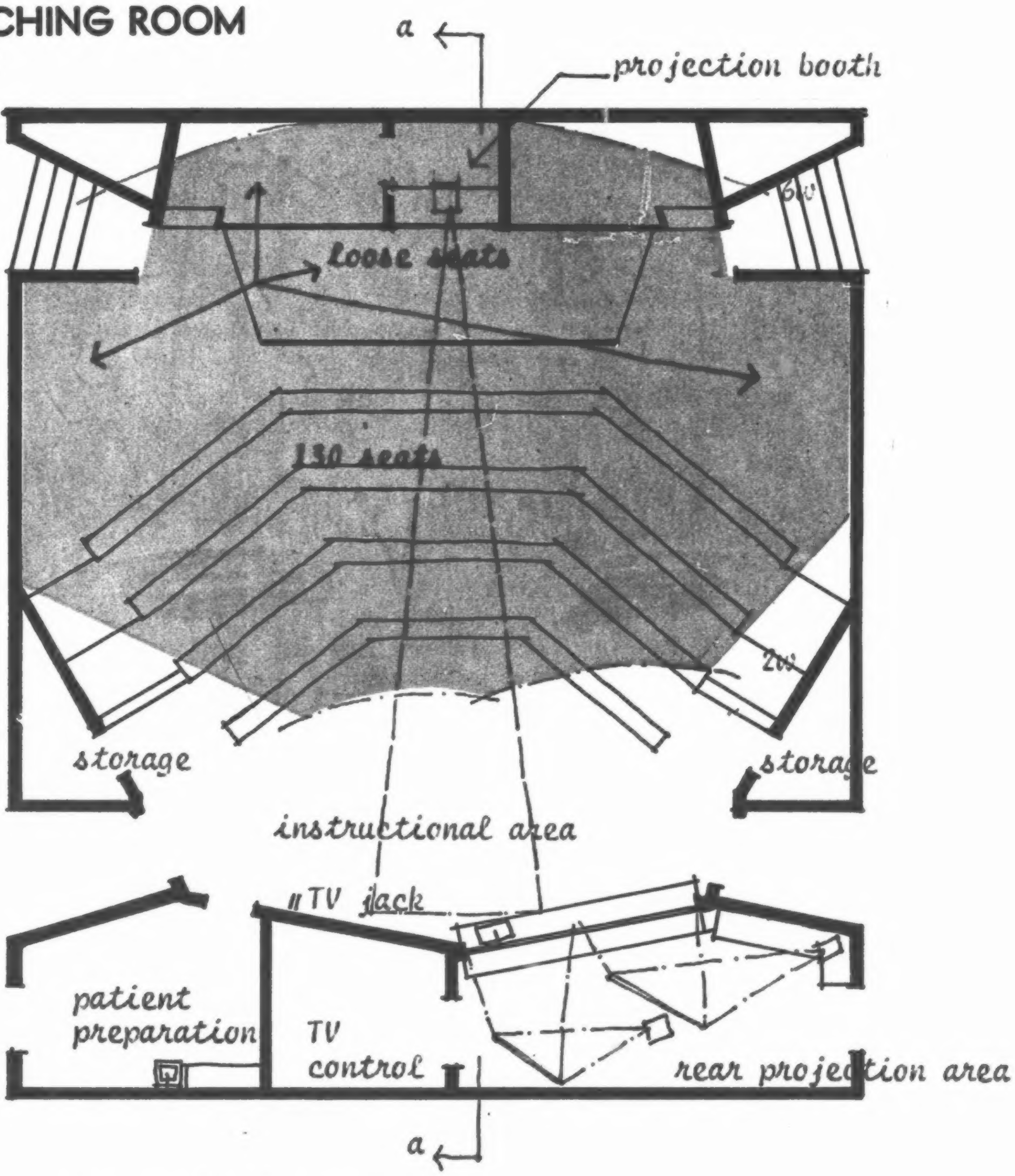
- large teaching room
  - — minimum recommended area for 100 occupants — 1500 sq. ft.
  - — minimum recommended area for 200 occupants — 2700 sq. ft.
- projection and storage area — 200 sq. ft.
- patient preparation area — 120 sq. ft.

LOCATION:

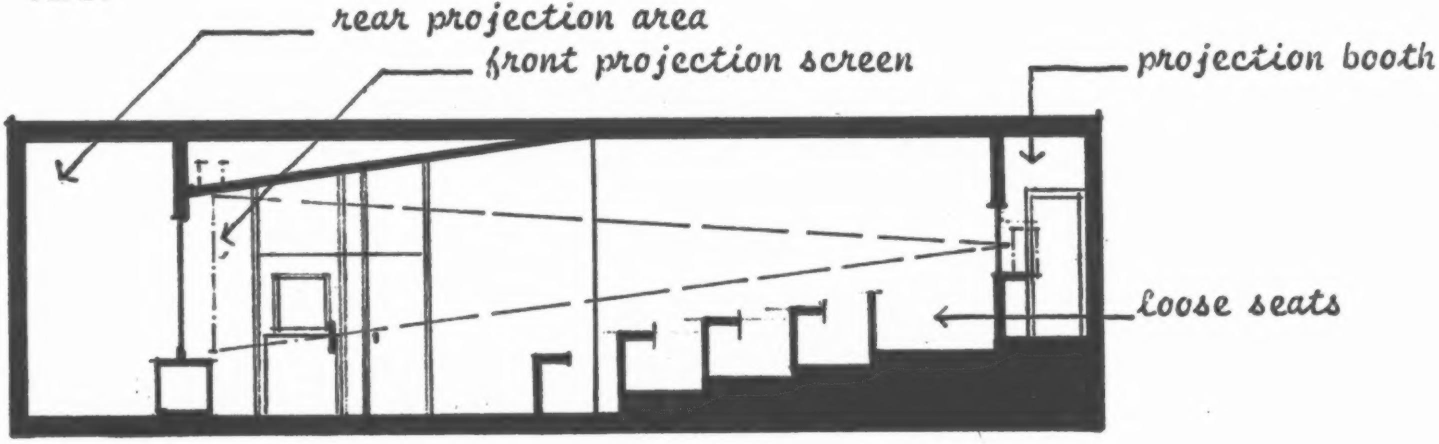
- may be either in nursing or administrative areas of the hospital
- adjacent to major horizontal and vertical circulation
- private access for patients appearing for demonstration purposes

H-I

LARGE TEACHING ROOM


a
projection booth
6w
loose seats
130 seats
2w
storage
storage
instructional area
TV jack
patient preparation
TV control
rear projection area
a

PLAN


rear projection area
front projection screen
projection booth
loose seats

SECTION A-A

0 5 10

H-I

LARGE TEACHING ROOM

FURNISHINGS AND EQUIPMENT:

- seating — continuous counter tops with loose seats or fixed seats with folding tablet arms (also loose seats in rear and side areas)
- chalkboard and tackboard surfaces
- overhead projection and screen surfaces
- rear projection systems for slide and motion pictures
- TV projection
- receptacle for TV origination, and camera stand for TV magnification system
- patient monitoring display panel
- sink (also in patient preparation room)
- service and utility connections — oxygen, suction, power, etc.
- storage cabinets (in patient preparation room)

LIGHTING:

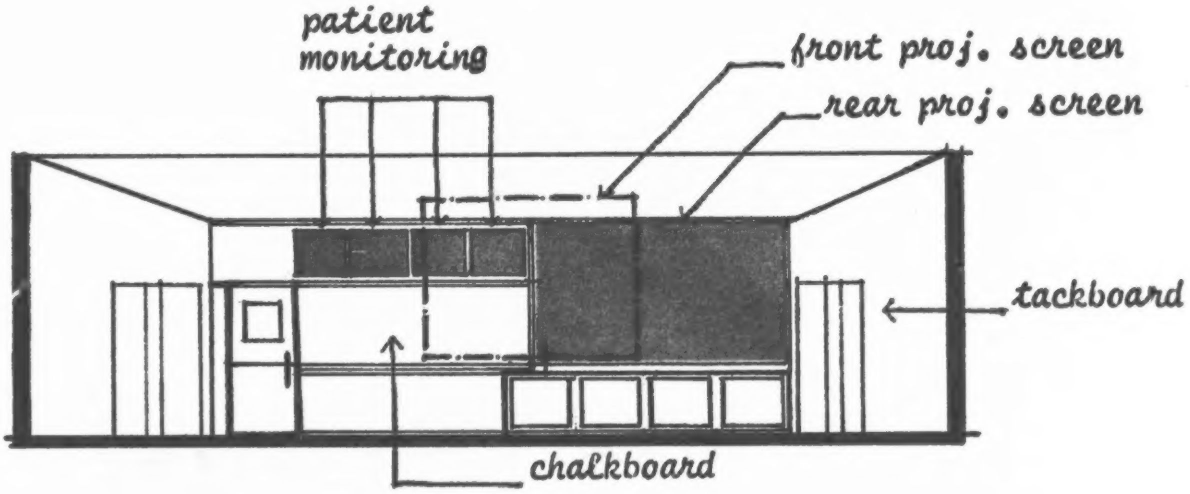
- directional system arranged to provide two levels of illumination
  - —low level which will spill no more than 2 footcandles of light on the screens
  - —high level of 40-60 footcandles on the writing surfaces
- supplementary lighting on display surfaces and demonstration area

ACOUSTICS:

Shaped ceiling and absorptive rear wall surfaces permitting non-amplified speech and free discussion.

CLIMATE:

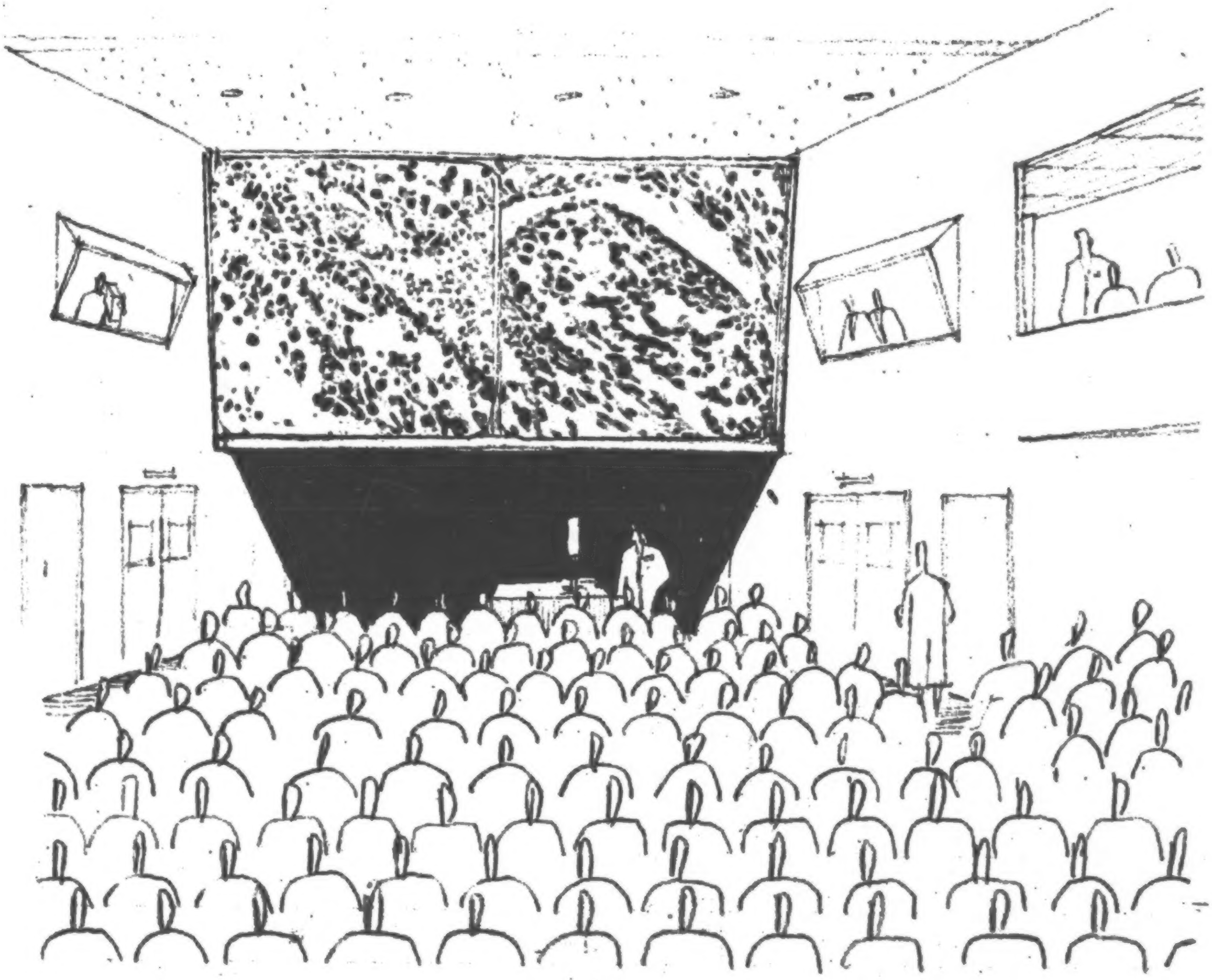
Windowless room requiring mechanical ventilation and preferably complete air-conditioning.



ELEVATION OF TEACHING WALL

H-2

EDUCATIONAL AUDITORIUM



INTERIOR PERSPECTIVE

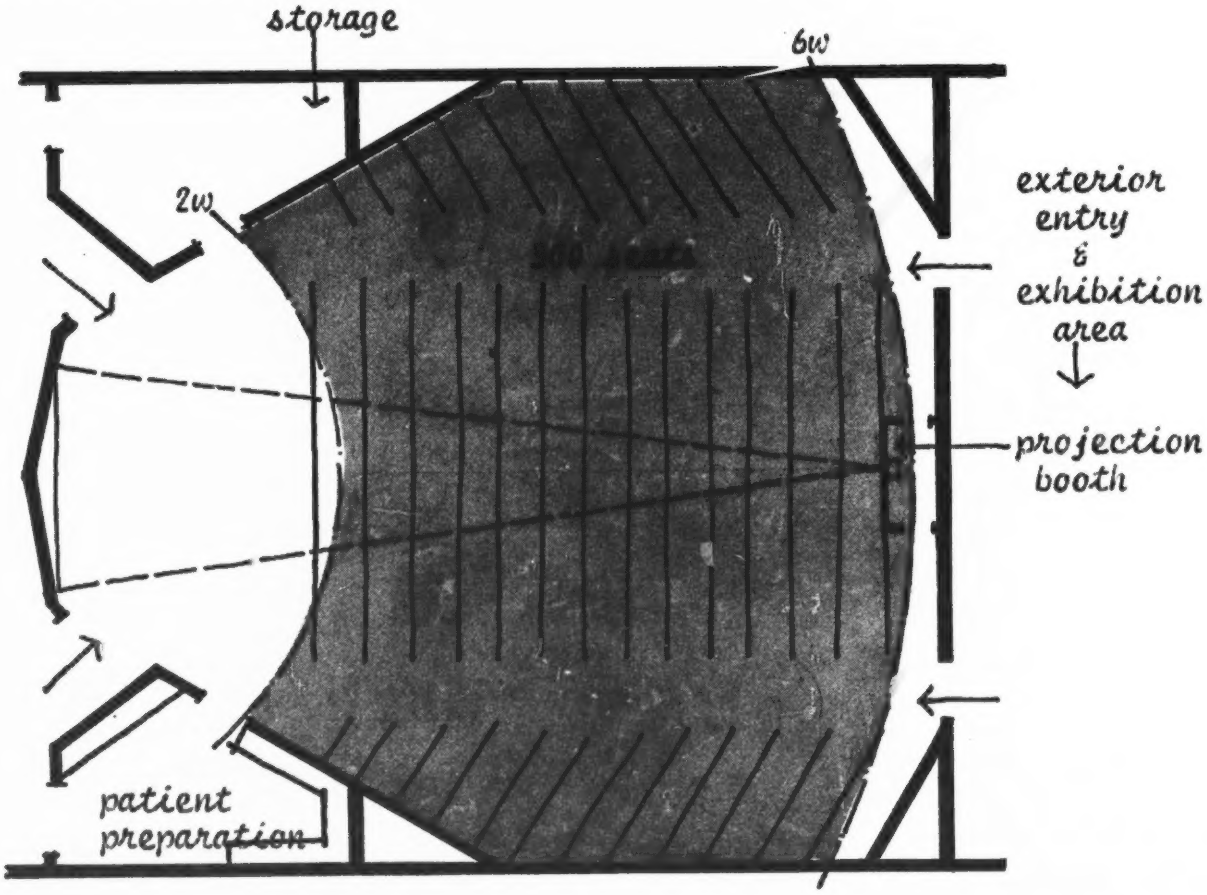
H-2

EDUCATIONAL AUDITORIUM

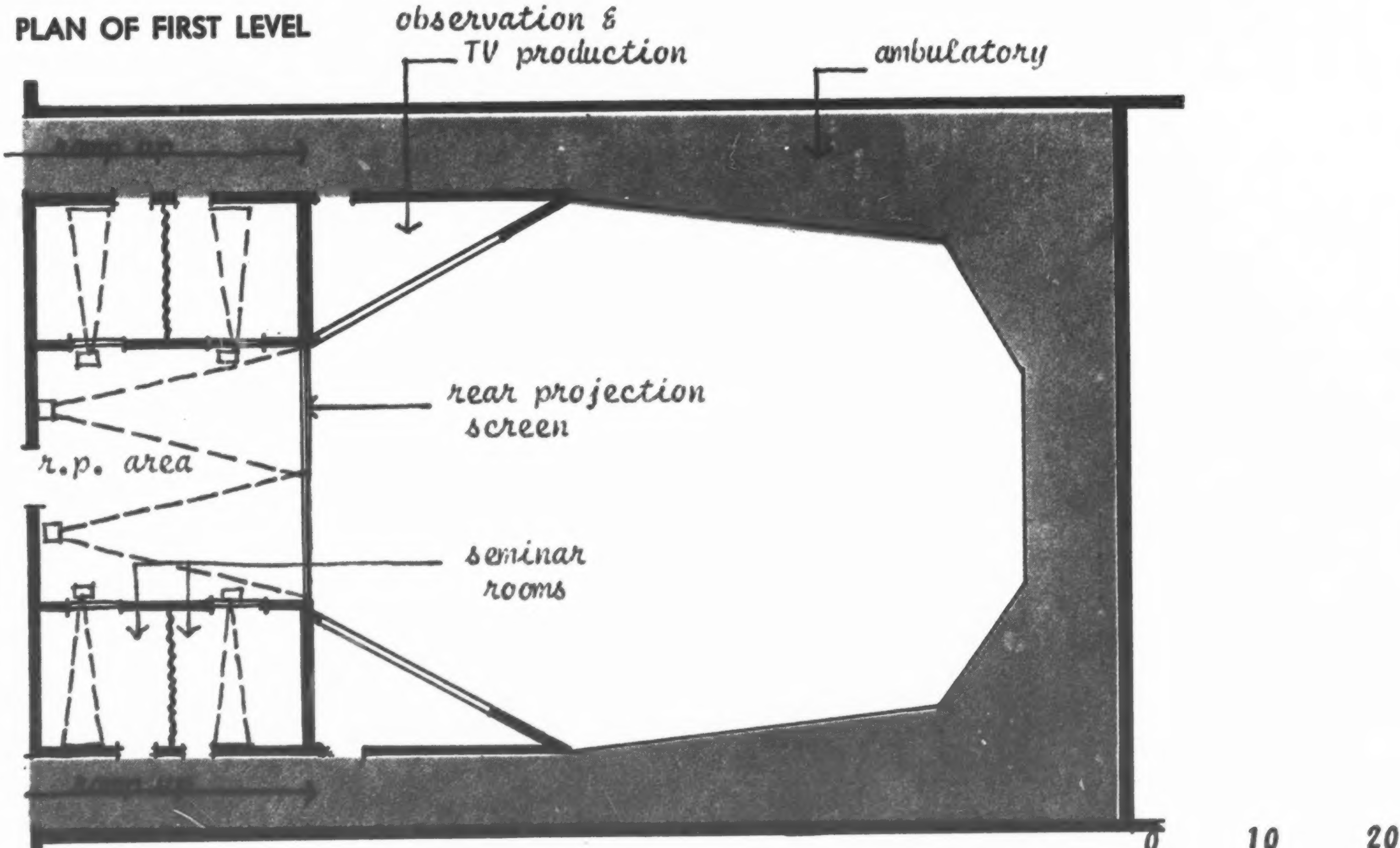
PURPOSE:	To make available a large auditorium appropriate for educational functions, as well as for patient entertainment and non-educational meetings.
PRINCIPAL USES:	• hospital-wide conferences, rounds, lectures, and demonstrations • in-service orientation and training programs • continuing education programs including meetings of professional societies, short courses, conferences, etc. • patient entertainment — movies, shows, etc. • semi-professional and non-professional meetings and conferences
USERS:	• personnel, staff, students and trainees of the hospital • personnel, staff, students and trainees of other institutions in the medical center • health science personnel in the community and region • civic groups and organizations
QUANTITY:	Availability of one per VA teaching hospital.
SPACE REQUIREMENTS:	• accommodate 300 or more persons for teaching situations with potential use of all instructional aids and media • permit the demonstration of one and two patients with all appropriate apparatus and monitoring devices • accommodate 300 or more patients for entertainment, primarily movies (10% of the capacity to be for wheelchair patients) • accommodate 300 or more persons for professional and non-professional meetings • adjunct spaces — — projection, preparation, and storage area — space for housing and readying rear projection equipment, preparing materials and demonstrations, and storing "ready" materials. — patient preparation area — space for readying and holding patients used in demonstrations and presentations
SIZE:	• teaching auditorium — 3400 sq. ft. for 300 persons 8000 sq. ft. for 800 persons • projection, preparation and storage — 600 sq. ft. minimum • patient preparation — 120 sq. ft. minimum
LOCATION:	• either in the hospital or in other affiliated institutions, if physically close and convenient for staff, students, and patients — (generally, a weatherproof connection will be necessary) • adjacent to major circulation paths within the hospital and major public access to the hospital

H-2

EDUCATIONAL AUDITORIUM


storage
6w
2w
300 seats
exterior entry & exhibition area
projection booth
patient preparation

PLAN OF FIRST LEVEL


observation & TV production
ambulatory
ramp up
rear projection screen
r.p. area
seminar rooms
ramp up
0
10
20

PLAN OF SECOND LEVEL

H-2

EDUCATIONAL AUDITORIUM

FURNISHINGS AND EQUIPMENT:

- auditorium seating with folding writing surfaces
- full range of information display and communications systems — films, slides, television, overhead projector, etc.
- service and utility connections for demonstrations
- patient monitoring devices
- sink and storage cabinets in patient preparation area
- facilities for television origination and magnification

LIGHTING:

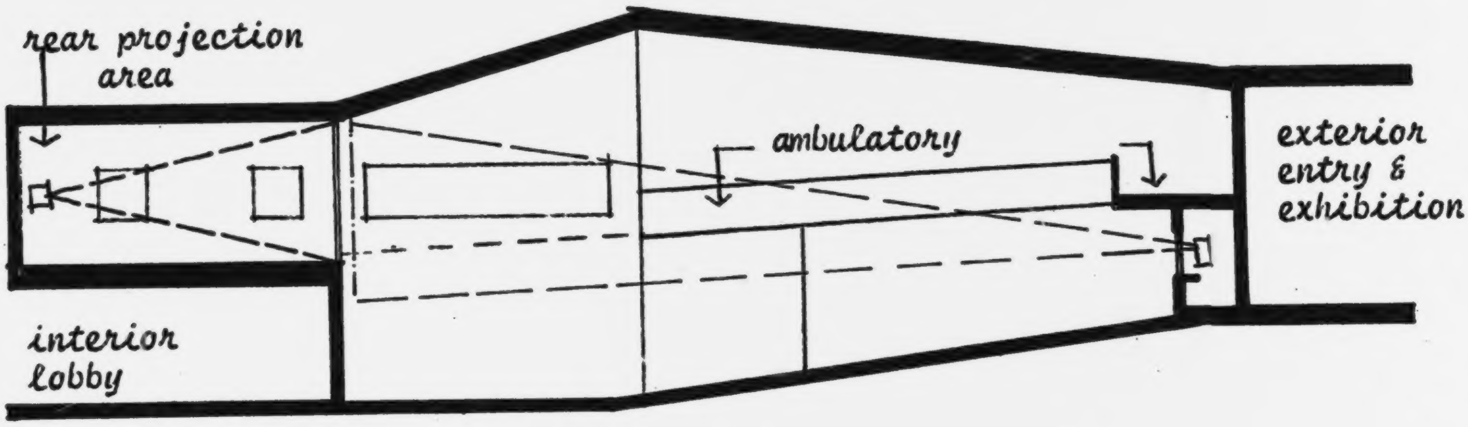
- directional system arranged to provide three levels of illumination
  - —low level which will spill no more than 2 footcandles of light on the screens
  - —intermediate level of 10-20 footcandles on the writing surfaces
  - —high level of 40-60 footcandles on the writing surfaces
- supplementary lighting on display surfaces and demonstration area

ACOUSTICS:

- shaped ceiling and walls with absorptive rear walls
- planned for non-amplified live sound
- high quality sound system for recorded sound

CLIMATE:

Mechanical ventilation with complete air-conditioning preferable.



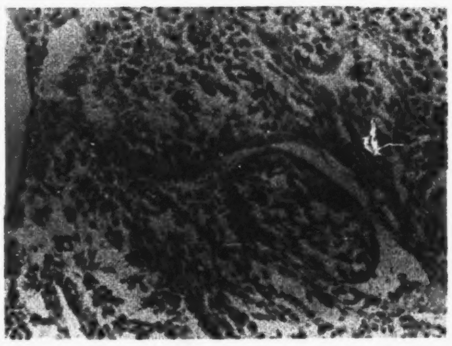
SECTION

Another opportunity for sharing

If an adequate learning resources center for clinical teaching does not exist or is not planned elsewhere in the medical center, then it would be desirable for the *VA* teaching hospital to include one as part of its contribution to the total educational system of the center. As with the teaching auditorium, the Resources Center provides an opportunity for the *VA* hospital to complement and supplement other facilities but not to duplicate them.

Functions of the Resources Center — H-3

The hospital-wide resources center would provide access by individual teachers and students to a complete range of resources necessary for education in the health sciences. Access would not be limited to medical staff and students, but would also be available to therapists, psychologists, dietitians, and others. It would also serve many other important functions as well, as indicated in the program and design study for such a facility, presented on the following pages as facility H-3.



To further illustrate the potential role of the hospital-wide Resources Center, one further planning philosophy is suggested. At least four departments and services in the *VA* hospital produce instructional resources as a part of their functions. Radiology provides x-ray films and reports; Pathology produces slides and specimens with accompanying reports; Medical Records organizes and stores records which may be the basis for research, study, and the development of classic cases; and Medical Illustration (later to be referred to as the Educational Support Center) produces a variety of additional supplementary resources. From an educational standpoint, it would be highly desirable to organize these resources so that they may be readily available for use by student and teacher. The focal point for such an organization would be the Resources Center, and it is, therefore, proposed that in planning the hospital, this Center be physically located between these four "resource" services. In this way, the films, x-rays, records, and so on, may still be retained in the possession of the appropriate service, but can be readily accessible and integrated into the resources of the Center.

Reducing time and frustrations

This concept is expressed in the diagram included with the design study for facilitiy H-3. Not only does this concept render the resources more readily available for instructional use, but it reduces the time required and frustration often experienced in assembling these materials from points scattered about the entire hospital. It is principally because of the inconvenience and difficulty of collecting these materials that they are not being used for instructional purposes.

The Educational Support Center

Expand existing Medical Illustration Service to become Educational Support Center

In existing teaching hospitals it is interesting to note the additional roles that the Medical Illustration Department has assumed over and above its original concept. In some cases its functions may include still and motion picture photography, coordination of television, maintenance and upkeep of audio-visual equipment, and the production of transparencies, in addition to the more conventional development of graphic arts. These additional roles are a natural result of the increased concern with improving the processes of teaching and with utilizing the most effective means of communication. These, like other functions to be suggested, are all directed at enhancing the instructional processes by producing appropriate resources and materials, and by rendering technical and pedagogical assistance to the teaching staff. It is recommended that, as new *VA* replacement hospitals are planned and old *VA* hospitals remodeled, this concept of educational support be adopted, and that the Department of Medical Illustration be expanded to encompass the personnel, functions, equipment, and facilities of an Educational Support Center.

Just as with the Teaching Auditorium and the Resources Center, the Educational Support Center provides an opportunity for the *VA* hospital to complement and supplement the functions and facilities found throughout the remainder of the Medical Center. If adequate film production facilities are available elsewhere in the Center, the *VA* hospital should not duplicate them, but may provide instead other commonly needed facilities which are lacking. Thus, in providing a share of the total support activities, it becomes an integral part of the total educational support activities of the center. For this reason, the programming of the Educational Support Center is very much a matter of local concern.

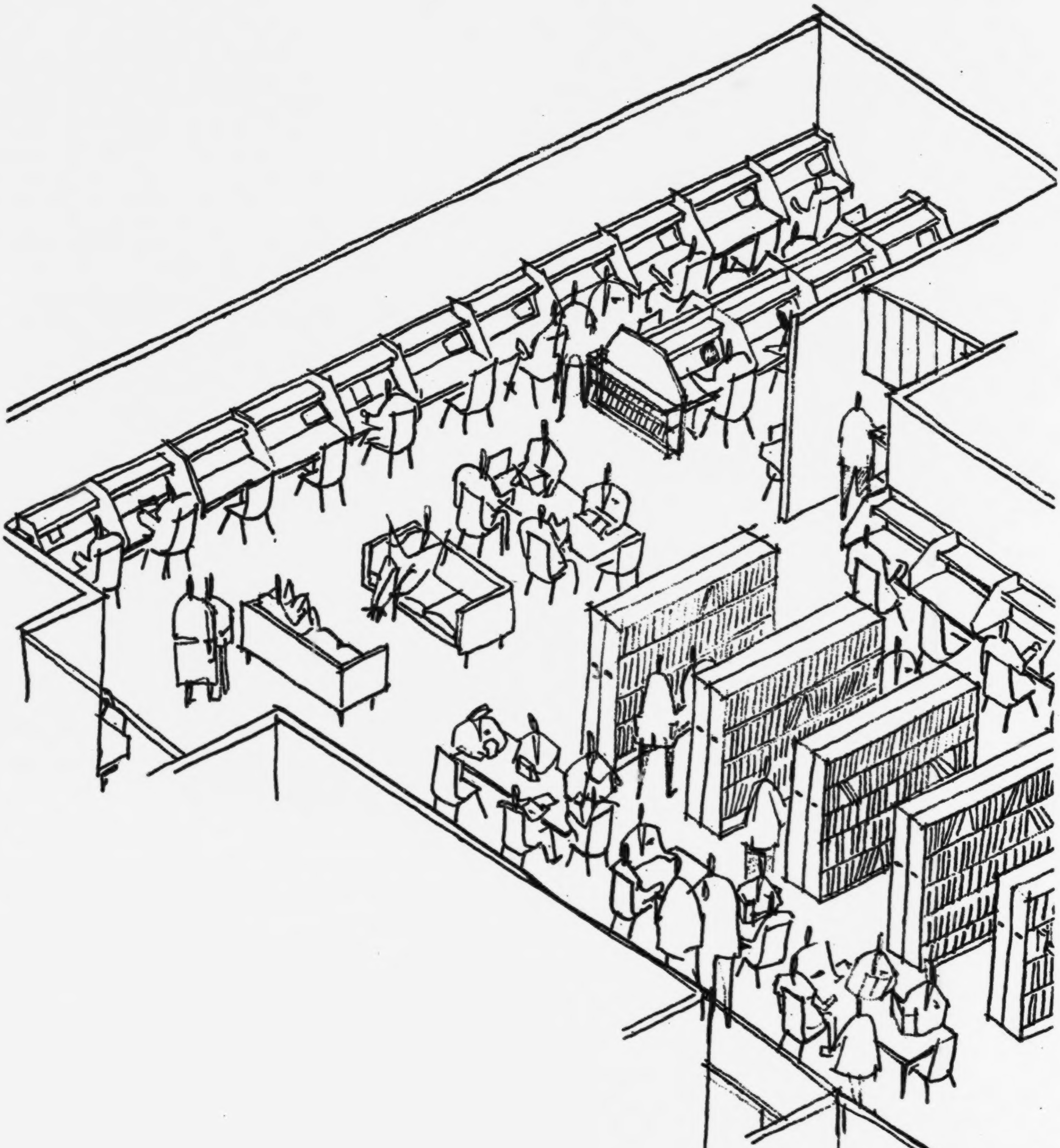
Possibility of regional planning for educational support

The information and design studies presented as facility H-4 are generalized and more extensive than would be necessary in most *VA* hospitals, since it is anticipated that every center will have some existing support facilities of this kind. In fact, it is not essential that all these support services be contained within the total medical center. It may be that colleges, public schools, businesses and industrial concerns in the community already provide adequate facilities and services of this kind which are available, and that the educational support function should be planned on a regional basis with potential savings and extension of services to all concerned.

The functions of this facility, as indicated on the design study program, require appropriately experienced staff, in addition to space, equipment and supplies. The staff would include technicians and personnel with competency in special areas such as television and motion picture photography, and generalists who would offer pedagogical and educational research advice to the teaching staff.

H-3

LEARNING RESOURCES CENTER



ISOMETRIC VIEW OF RESOURCES AREA

H-3

LEARNING RESOURCES CENTER

PURPOSE:

To make learning resources of all types available for individual and classroom use by all appropriate persons in the hospital, medical center, and medical community.

PRINCIPAL USES:

- make learning resources of all types — books, periodicals, reprints, films, slides, transparencies, audio and video tapes, recordings, x-rays, EKG's, EEG's, classic cases and records, models, and specimens — accessible to individual teachers, students, trainees, staff members, hospital personnel, and professionals in the community
- make learning resources available for organized use in conferences, seminars, rounds, and other group teaching situations
- provide for individual study, review, leisurely professional reading and study, case preparation, research, and satisfying intellectual curiosity
- provide for small group learning where accessibility of resources is important
- serve as an adjunct to in-service and continuing education programs
- create a focus for professional study in the community

USERS:

- all staff, personnel, students and trainees of the hospital
- all other appropriate professional persons in the medical center and community

QUANTITY:

One for each VA hospital.

SPACE REQUIREMENTS:

- generally accommodate 20 to 40 persons at any one time
- the size of the "using area" and the resource storage area will depend on the size of the hospital, its teaching program, and the proximity and accessibility of resources elsewhere in the medical center
- "using area" to include comfortable chairs, reading tables and chairs, carrels, and small seminar rooms

SIZE:

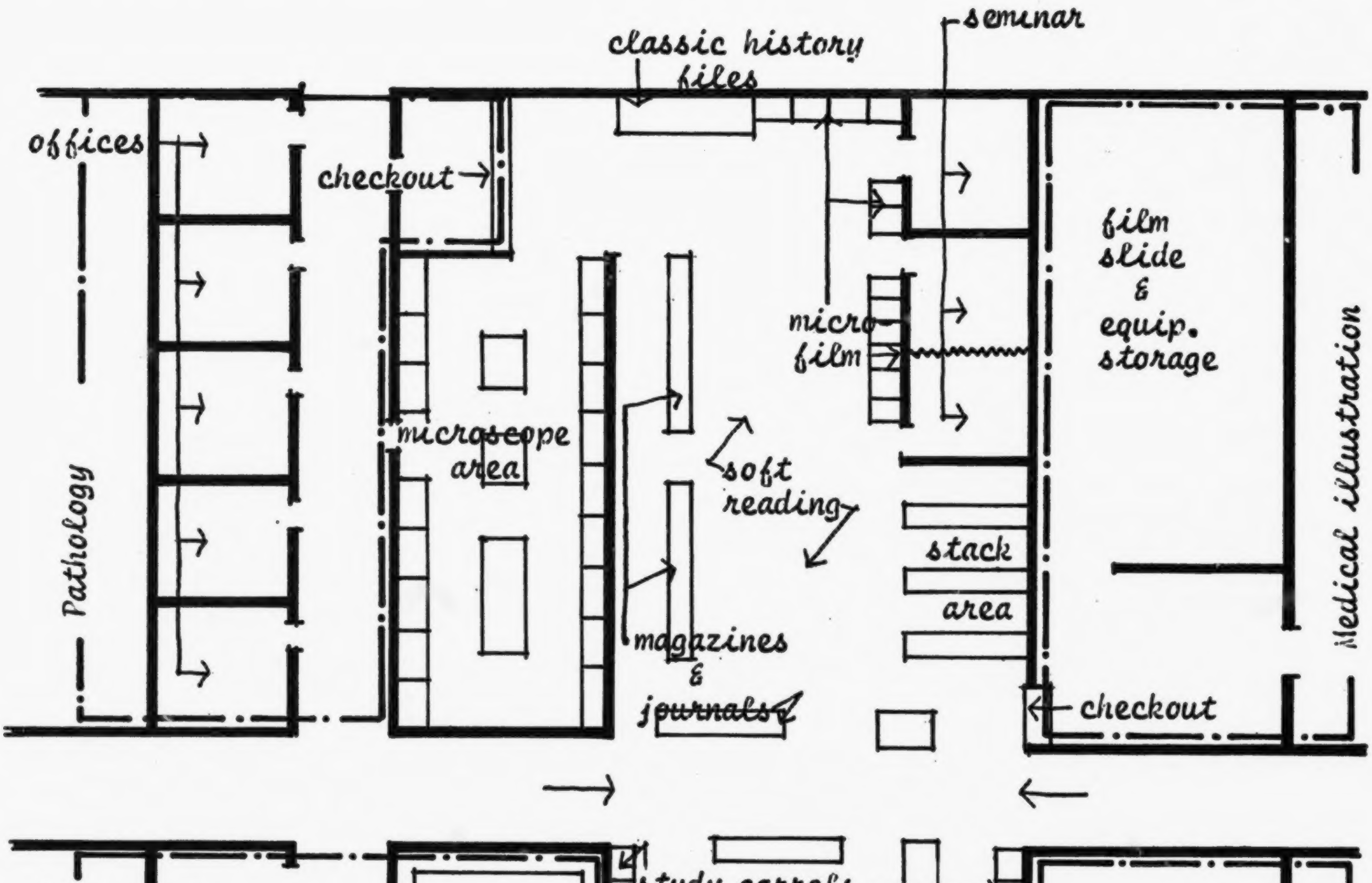
- dependent on the role of the library in the total medical center
- generally between 25 and 40 sq. ft. per user

LOCATION:

- easily accessible on the ground floor of the hospital
- adjacent to major hospital circulation and near major public access
- directly related to radiology, pathology, medical records, and medical illustrations

H-3

LEARNING RESOURCES CENTER


seminar
classic history files
offices
checkout
micro-film
film slide & equip. storage
Medical illustration
microscope area
soft reading
Pathology
stack area
magazines & journals
checkout
offices
study carrels
x-ray storage
stack area
medical record storage
checkout
checkout
Radiology
medical records
offices
electronic carrels
0
10
20

PLAN

H-3

LEARNING RESOURCES CENTER

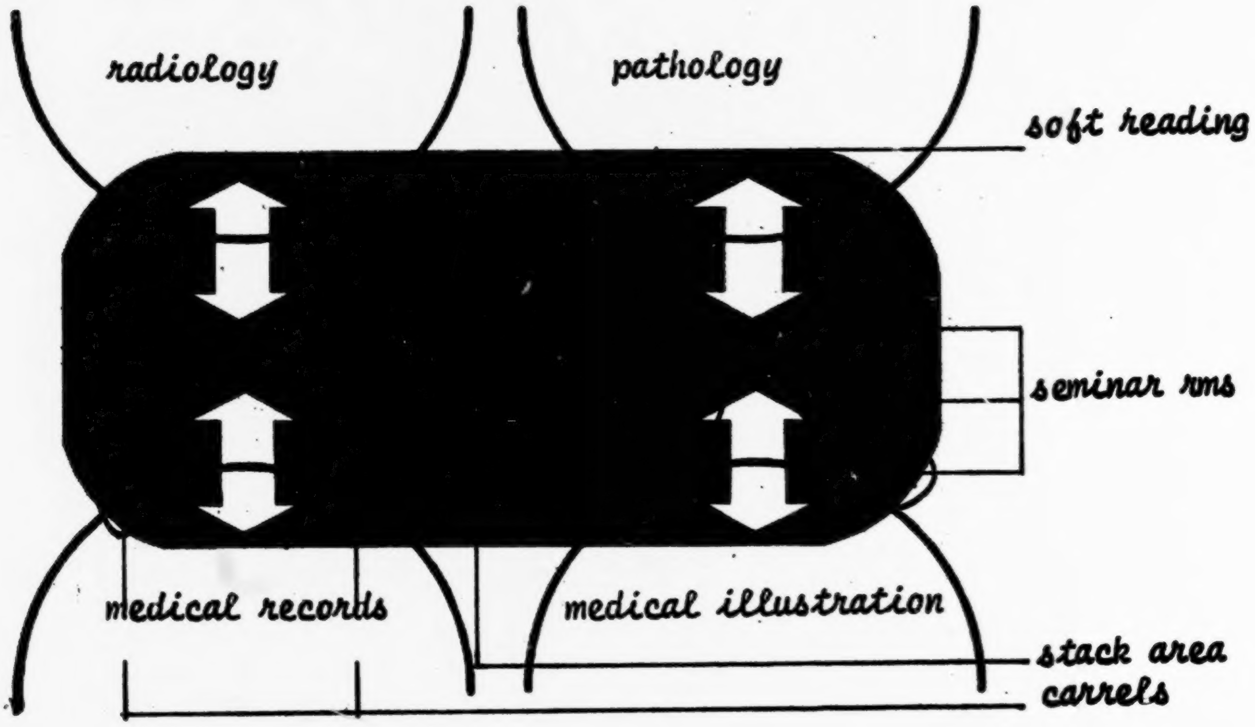
FURNISHINGS AND EQUIPMENT:

- resources storage and access area — book shelves; periodical racks; films, tapes, and slide cabinets; portable projection and sound equipment; x-ray film and record files, etc.
- using area — carrels for use of portable equipment and audio video communication system, study-work carrels, dictating-listening-typing cubicles, lounge furniture, library tables and chairs, carpeting, bulletin and display panels
- circulation and control desk with files and indexes
- seminar rooms to have comfortable chairs with small, modular tables

LIGHTING: Overall illumination of 30-40 footcandles with individual work lights at carrels and study stations.

ACOUSTICS: Acoustical isolation.

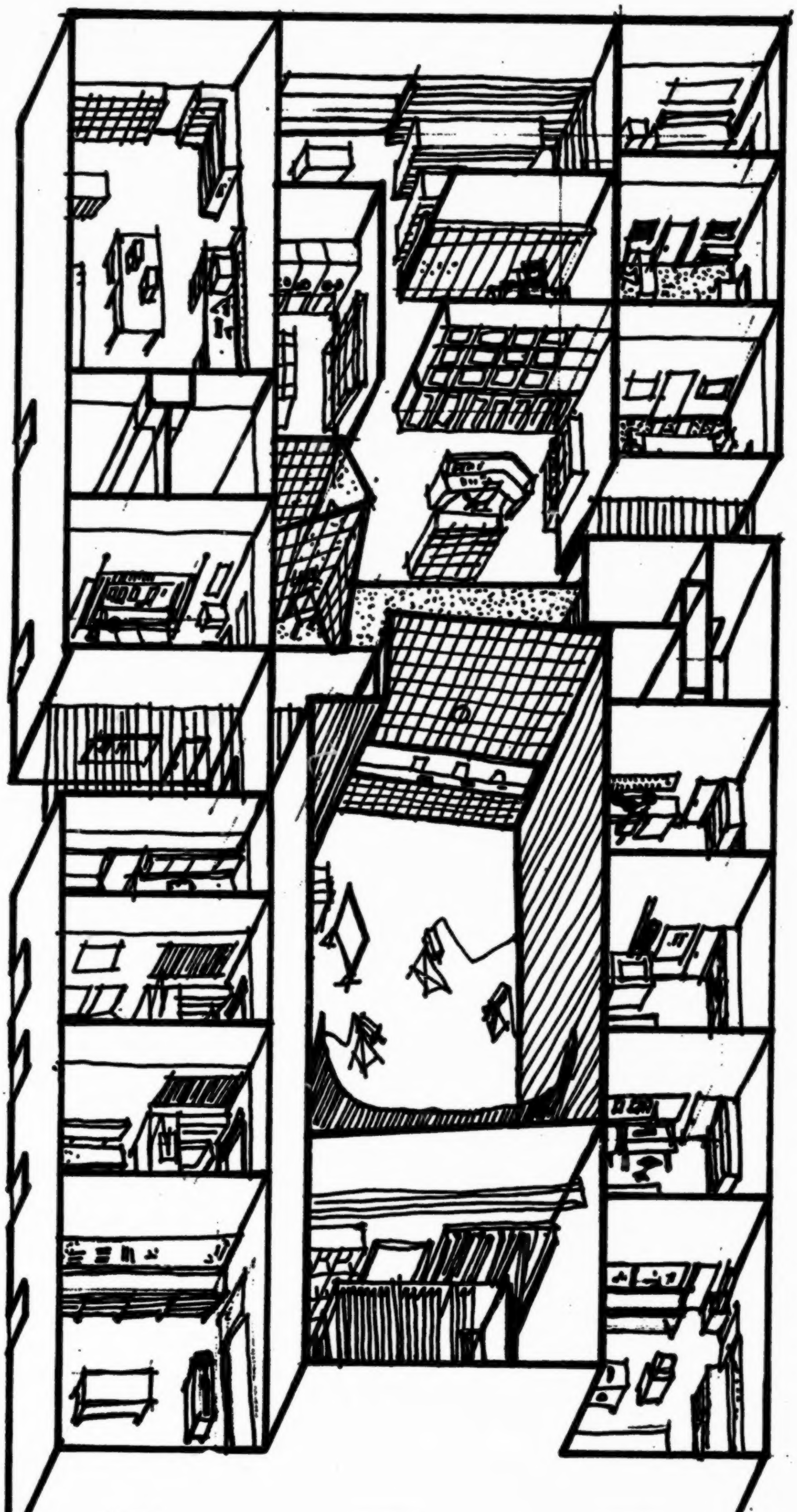
CLIMATE: Complete air-conditioning desirable.


radiology
pathology
soft reading
seminar rms
medical records
medical illustration
stack area
carrels

RELATIONSHIP DIAGRAM

H-4

EDUCATIONAL SUPPORT CENTER



ISOMETRIC OF EXTENSIVE SUPPORT CENTER

H-4

EDUCATIONAL SUPPORT CENTER

PURPOSE:

To support education and training throughout the hospital by producing instructional aids, and by rendering technical and pedagogical assistance to the teaching staff.

PRINCIPAL USES:

- producing films, film loops, slides, photographs, and overhead transparencies
- film material processing
- producing charts, graphs, illustrations and art work
- audio recording and distribution
- printing and duplicating
- model, apparatus and mannequin construction and assembly
- production, coordination, distribution, recording of studio, remote, or "off the air" television
- maintenance and repair of instructional equipment such as projectors
- woodworking, metal working, painting and storage of materials as necessary for the above activities
- planning, advising and coordinating of instruction through assistance rendered to the teaching staff
- offering of technical assistance in all instructional situations

USERS:

- all persons with teaching responsibilities would draw on the services of this Support Center
- a small staff of pedagogists, multi-media experts, technicians, producer-directors, camera men, photographers, illustrators, and clerical assistants would actually operate the Center

QUANTITY:

One for each VA hospital.

SPACE REQUIREMENTS:

- the total size and the type of facilities included would depend on the educational programs and the availability of support activities elsewhere in the medical center and community
- the total system of educational support facilities would include film studios; TV studios, control, engineering, and distribution; dressing rooms and preparation area; shops, audio recording studios; offices and conference rooms; processing laboratories; drafting and work rooms; receiving and storage

SIZE:

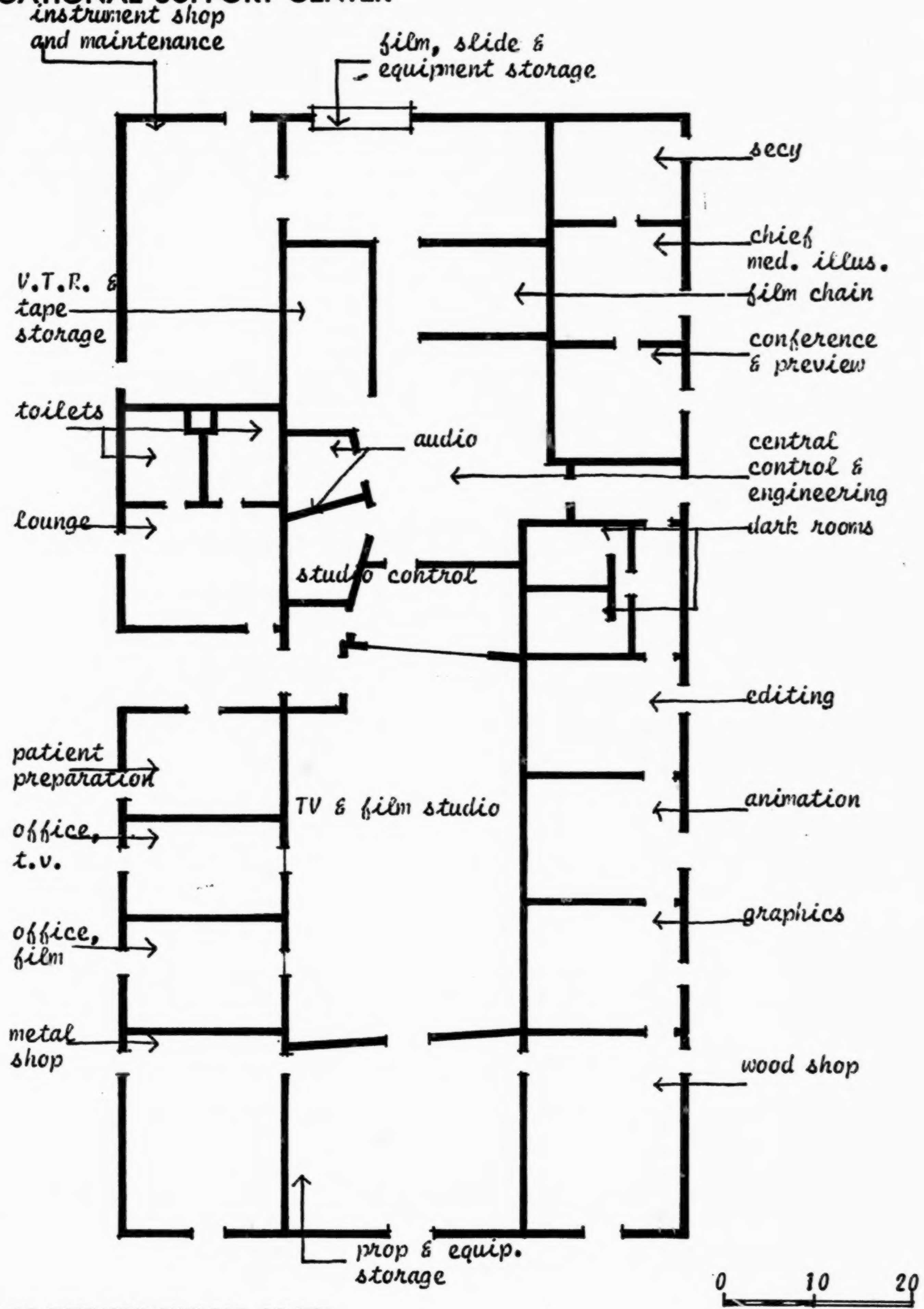
Dependent on the extent of support facilities provided by the VA hospital and by other institutions.

LOCATION:

- on the ground or basement floors with direct service access
- permit easy movement of equipment, staff, and patients to and from other areas of the hospital
- directly related to the Resources Center

H-4

EDUCATIONAL SUPPORT CENTER


instrument shop
and maintenance
film, slide &
equipment storage
secy
chief
med. illus.
film chain
V.T.R. &
tape
storage
conference
& preview
toilets
audio
central
control &
engineering
lounge
dark rooms
studio control
editing
patient
preparation
TV & film studio
animation
office,
t.v.
office,
film
graphics
metal
shop
wood shop
prop & equip.
storage
0
10
20

PLAN OF EXTENSIVE SUPPORT CENTER

H-4

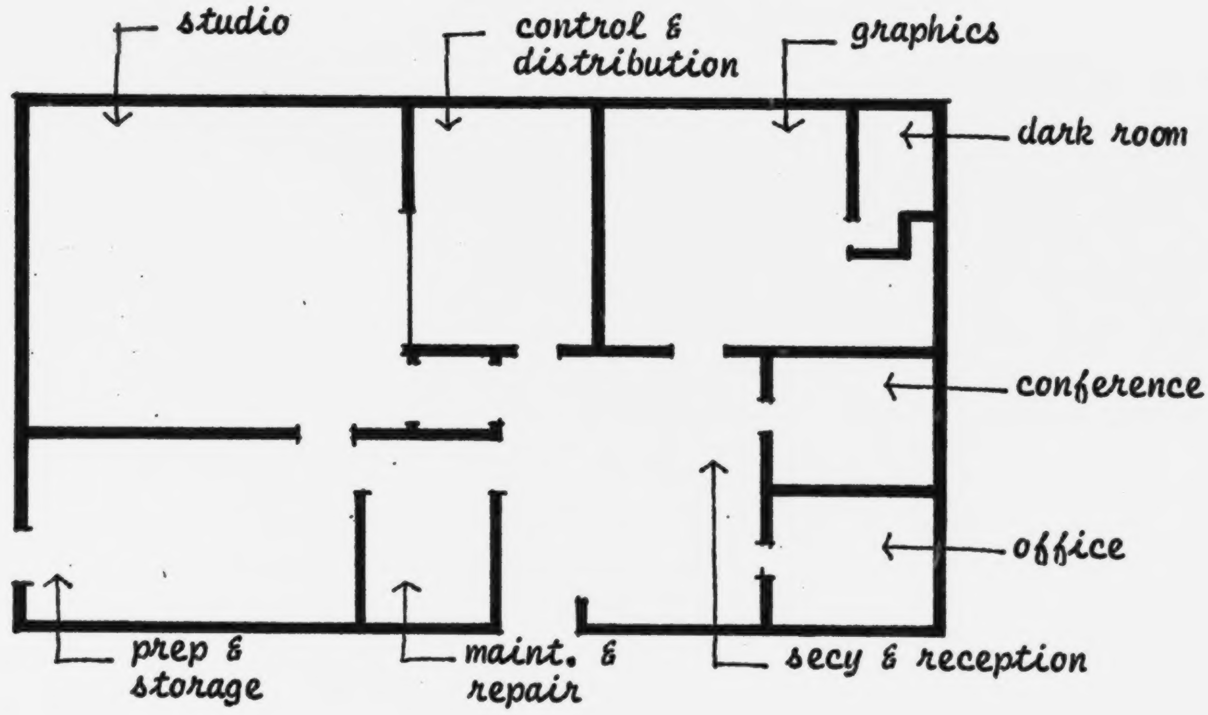
EDUCATIONAL SUPPORT CENTER

FURNISHINGS AND EQUIPMENT: Typical for the particular components of the Center such as film and TV studio, graphic arts studio, film processing laboratory, etc.

LIGHTING: Typical for the particular components of the Center such as film and TV studio, graphic arts studio, film processing laboratory, etc.

ACOUSTICS: Typical for the particular components of the Center such as film and TV studio, graphic arts studio, film processing laboratory, etc.

CLIMATE: Typical for the particular components of the Center such as film and TV studio, graphic arts studio, film processing laboratory, etc.


studio
control & distribution
graphics
dark room
conference
office
prep & storage
maint. & repair
secy & reception

PLAN OF LIMITED SUPPORT CENTER

A Continuing Education Center

Relating facilities to create a Continuing Education Center

For a *VA* hospital located in a region where it can appropriately assume leadership in professional affairs, it may be that a number of facilities discussed in this and subsequent chapters, together with adjunct facilities, should be brought together in a Continuing Education Center. Such a Center could become an addition to an existing hospital or might be built as a separate unit. In any case, the Continuing Education Center would be established as a separate and well-defined element oriented in its functions and physical planning toward the community and the medical personnel of the region (Figure 3).

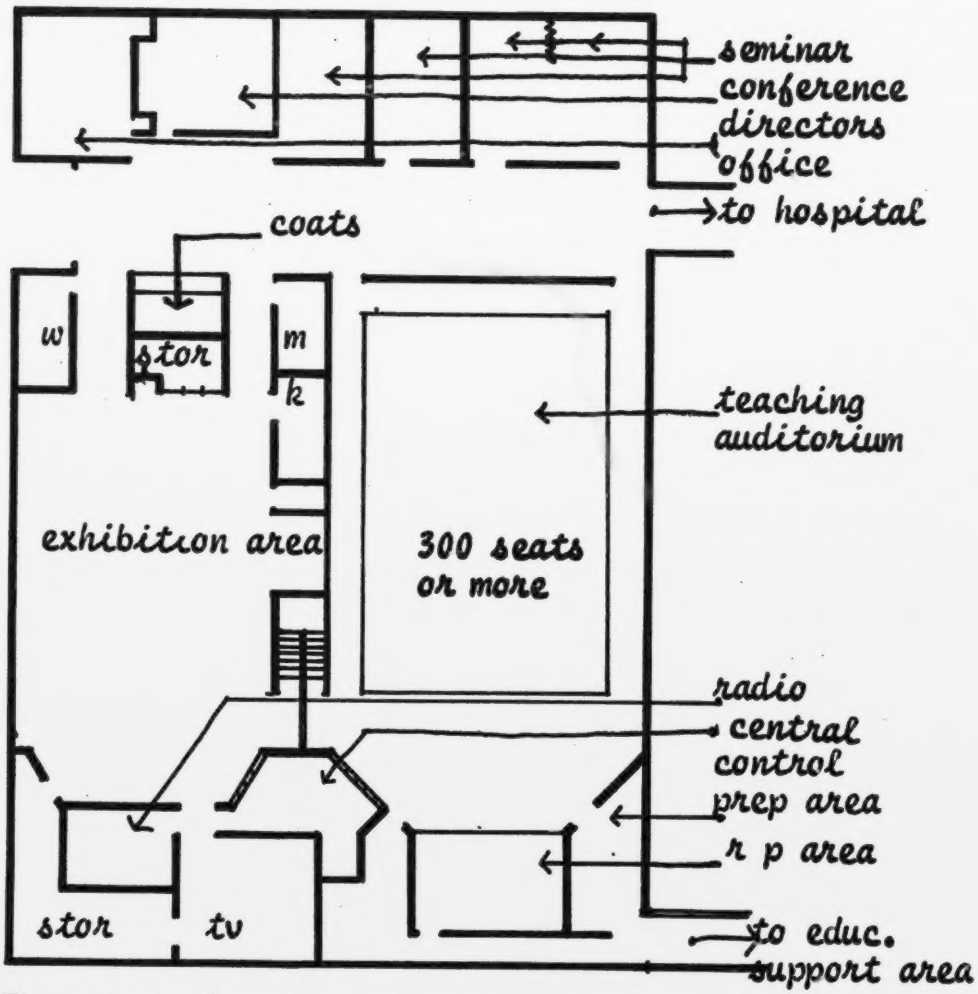

seminar
conference
directors
office
to hospital
coats
w
stor
m
k
teaching auditorium
exhibition area
300 seats or more
radio
central control
prep area
r p area
stor
tv
to educ. support area

Figure 3. A scheme for a Continuing Education Center showing its relationship to the remainder of the Hospital.

Center still serves hospital-wide needs

Such facilities as the educational auditorium, conference and seminar rooms, production and origination center, exhibition area, and other adjunct spaces, which would be housed in the Continuing Education Center would also serve their normal educational function for the hospital. By gathering these facilities together as an entity, the continuing education mission and the community orientation of the hospital would be emphasized and encouraged and, at the same time, some of the problems of extraneous traffic interfering with the day-by-day operations of the hospital would be eliminated.

Informal Educational Facilities

Importance of informal learning

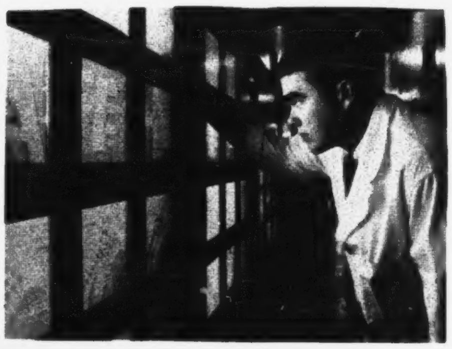
In later chapters, the discussion of educational facilities related to services and nursing units emphasizes the need for facilities which encourage informal interchange and learning. Two such facilities should be considered on a hospital-wide basis.

Dining provides one such opportunity

In the medical world, as in the business world, the time of nourishment is also opportune for informal conference and talk. A teaching hospital should capitalize on such opportunities for informal exchange between staff, consultants, students, and trainees by encouraging their meeting together in small groups over breakfast, lunch, dinner and coffee breaks. Dining facilities scheduled and planned for the typical "eat it and beat it" philosophy in no way encourage such informal learning.

Less rigid scheduling and special facilities

It is recommended that serious consideration be given to the potential of dining facilities which encourage informal learning, and that these facilities be scheduled to permit enough freedom for small groups to linger over meals and coffee breaks to discuss, react, and learn together, as well as to eat. In addition to less rigid scheduling, consideration should also be given to creating a number of small, private dining rooms or dining alcoves where groups of 6 to 12 persons may have a semblance of privacy. These alcoves or semi-private rooms could be planned so that when not being used for this purpose, they can be opened and become part of the overall dining facilities.



Museums and exhibits provide another opportunity

In a number of locations throughout the hospital, particularly in lobbies and areas of major traffic circulation, there are opportunities for informal education and learning through displays and exhibitions. These need not always be the static type of museum exhibits to which many medical schools are accustomed, but can be well-designed, colorful, manipulative, and highly instructional. Such exhibits can be changed frequently, and moved about the medical center and community for additional educational usage. They can be adjuncts or supplements to classroom work, or may be prepared simply for general interest. The whole task of designing and constructing such exhibits should be one of those additional functions handled by the Educational Support Center.

Team Training Facilities —
The Home Environment Demonstration Suite

One of the important trends in medical education is the increased concern with the training of the various health-care personnel as members of a team. This concept is reflected in the planning of facilities for services, floors, and nursing units which are discussed later, but there is also one facility for hospital-wide use that should be designed specifically to encourage the team approach. This is the Demonstration Suite, which brings together the dietitian, social worker, medical stu-

Demonstration Suite one of several facilities for the team approach

dent, psychologist, therapist, resident, and teacher, to work with patients in a setting similar to the home. Such a facility serves not only to bring members of the medical care team into contact with each other during training, but it also provides the opportunity for working with patients in a veriety of ways and under a variety of realistic conditions. Here the patient and the patient's family can be taught to readjust to normal existence and normal surroundings, and the various members of the health team gain a better understanding of the part each plays in the total rehabilitative process.

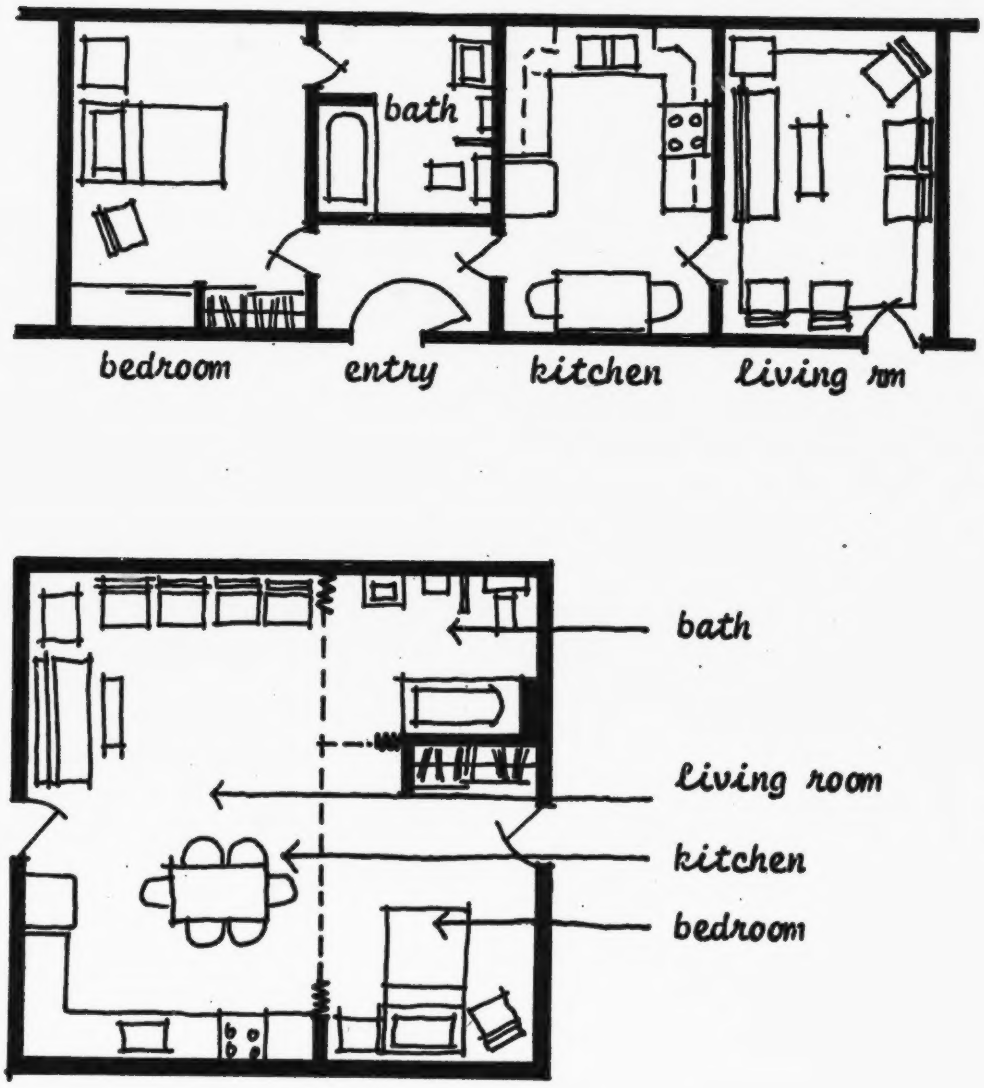


Figure 4. Two types of Home-Environment Demonstration Suite, both of which provide for team-learning and patient rehabilitation.

Two types of suite

Figure 4 illustrates two ways of planning a Home Environment Demonstration Suite. Though quite different in concept, each of these schemes contains a bedroom, kitchen, dining, and bathroom. Scheme A is designed for larger groups; Scheme B accommodates much smaller groups, and several groups may be working simultaneously in the various rooms. In both schemes, the bedroom and bath area can become sleeping quarters for "on-call" staff.

3. SERVICE AND FLOOR-RELATED FACILITIES

Introduction

Size of service varies

A *VA* hospital, or any hospital, is composed of a number of services or departments, each of which renders specific functions in providing optimum patient care and cure. Some services involve extensive staff, facilities and space, and are directly responsible for many patients and many functions, while others are small and play a minor role, and in some hospitals, may even not exist as separate entities. Yet, every department and service conducts education and training programs, or has the potential of conducting such programs if the necessity arises.

All have an educational potential

It is the purpose here to identify those services and departments in *VA* hospitals which usually involve education and training programs, to note the kinds of personnel and activities involved in each, and to consider the kinds of educational facilities each requires.

General Considerations

Examine needs of each service

First, it is important, in defining total building needs, to examine the educational programs and needs of each service and department independently. The definitions of various facility types which follow suggest that in some cases generalized solutions will help meet the needs of several departments, — but that there are also certain requirements which call for special solutions. Only by analyzing specific departmental and service programs and needs can the specialized facilities, and the generalized facilities, be identified and provided.

Necessary to define instructional methods

Secondly, various instructional methods and techniques require particular kinds of solutions. It has already been pointed out that educational facilities are more than mere spaces of a certain size, and that the instructional process demands particular responses in facilities. A conference cannot be effectively conducted in a lecture room, nor is a recitation-classroom correct for either purpose. So, in defining departmental and service needs, it is essential to identify the types of instructional and training methods employed, and the size of groups involved.

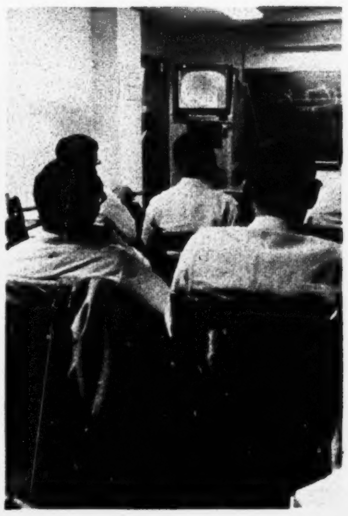
Multi-discipline use important

Third, the foregoing points should not be misconstrued as a recommendation for totally unidiscipline facilities. Even though some departments and services have special needs, many have requirements which can be accommodated by facilities which can be used in common. The multi-discipline usage of facilities is, in fact, the key to utilization rates that will justify their inclusion.

Facilities must be convenient and accessible

Fourth, educational facilities should be readily accessible and convenient to the persons in the services and departments involved in educational programs. Facilities are provided to enhance and facilitate the educational process; this will not be accomplished if they are located too far away, or are difficult to reach, or if they take personnel away from areas of responsibility. This means that a space utilization study may reveal less than optimum use of facilities, but this is one of the unique features of education in a hospital setting. If facilities are inconvenient and inaccessible — if they take persons out of direct contact or communication with their responsibilities in a department or service — the educational and training program will suffer.

Informal learning to be encouraged



Some facilities should also be provided which encourage informal, non-scheduled and unplanned learning, — learning which occurs when a resident sits down with a consultant for a few minutes to discuss a case or when several students corner a resident to discuss a particular diagnosis. Accessibility is essential, but so also is appropriate furniture and decor, a well-placed coffee pot, the provision of privacy, and care in planning the relationships between rooms. No specific rules can be established which will insure that facilities encourage informal learning, but an intimate knowledge of the processes of medical education and sensitivity in planning will be very helpful.

Proper equipment and communication systems important

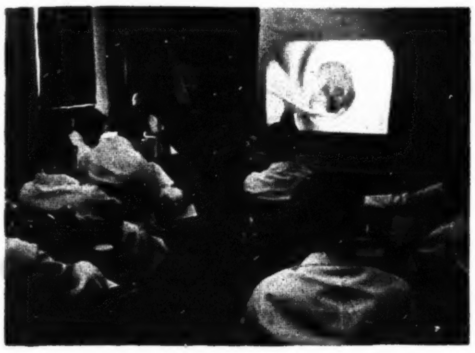
Fifth, just as spaces must be designed to support certain educational processes, so also, the rooms must be furnished with the necessary equipment, tools and aids needed in the learning process, and communication systems must be provided to receive and transmit necessary information, requests, and materials from other points in the hospital. Moreover, all facilities must be considered as elements of a *system* of facilities which supports education and training in the hospital. For instance, the clinical laboratories must be serviced by the central lab, and the resource sub-center is an extension of the main resource center of the hospital.

Dignify the role of the learner

Finally, the provision of educational facilities serves to elevate the status of the learner, and to make his training and learning experiences more effective. Medical training is basically the provision of learning experiences of the appropriate type and number, and this requires facilities which give the student or trainee an identity with the hospital environment, a place to conduct his work, to study, and to meet his peers and teachers. Many of the facilities which follow are needed, in part, to give the task of the learner a dignity too often lacking.

Nursing Floor Facilities

Classroom required for each nursing floor



It is recommended that each nursing *unit* be provided with a conference room in addition to an examination-treatment and a work-study area. But this conference room will not be adequate or appropriate for all of the educational and training functions occurring on the nursing floor. Many functions require that a larger facility be readily accessible and convenient; going to another floor or location in the hospital would greatly jeopardize, if not invalidate, the experience. Therefore, a Health Sciences Classroom such as illustrated on the following pages is recommended for each nursing *floor* in the hospital.

Alternate type of classroom for psychiatry

The Classroom identified as facility S-1 is designed primarily for medical and surgical nursing floors. It may also be used for neuropsychiatric nursing floors; or, at the discretion of the planners and programmers familiar with the local needs, the alternate plan S-2, designed specifically for psychiatry, may be substituted. When the alternate is used, patient care in the form of group therapy may be added to the list of functions to be accommodated. There should be a classroom of one of these types on each nursing floor in the hospital, unless a service-wide teaching room such as facilitiy S-4 or the hospital-wide teaching room (H-1) is located on that floor.

Need for student labs depends on school

A student clinical laboratory should also be considered for multidiscipline use on each nursing floor. Some medical schools require that residents and students carry out routine clinical laboratory procedures as part of their clinical training. Some other health science programs, too, — particularly nursing, dietetics and, of course, laboratory technology, — require practical experience in clinical laboratory procedures. The amount of time allocated, the emphasis on the experience and its role in total curricula vary greatly from school to school. The consensus is that practical clinical laboratory experiences should be available, but how and where they should be provided and how they are administered are points for debate.

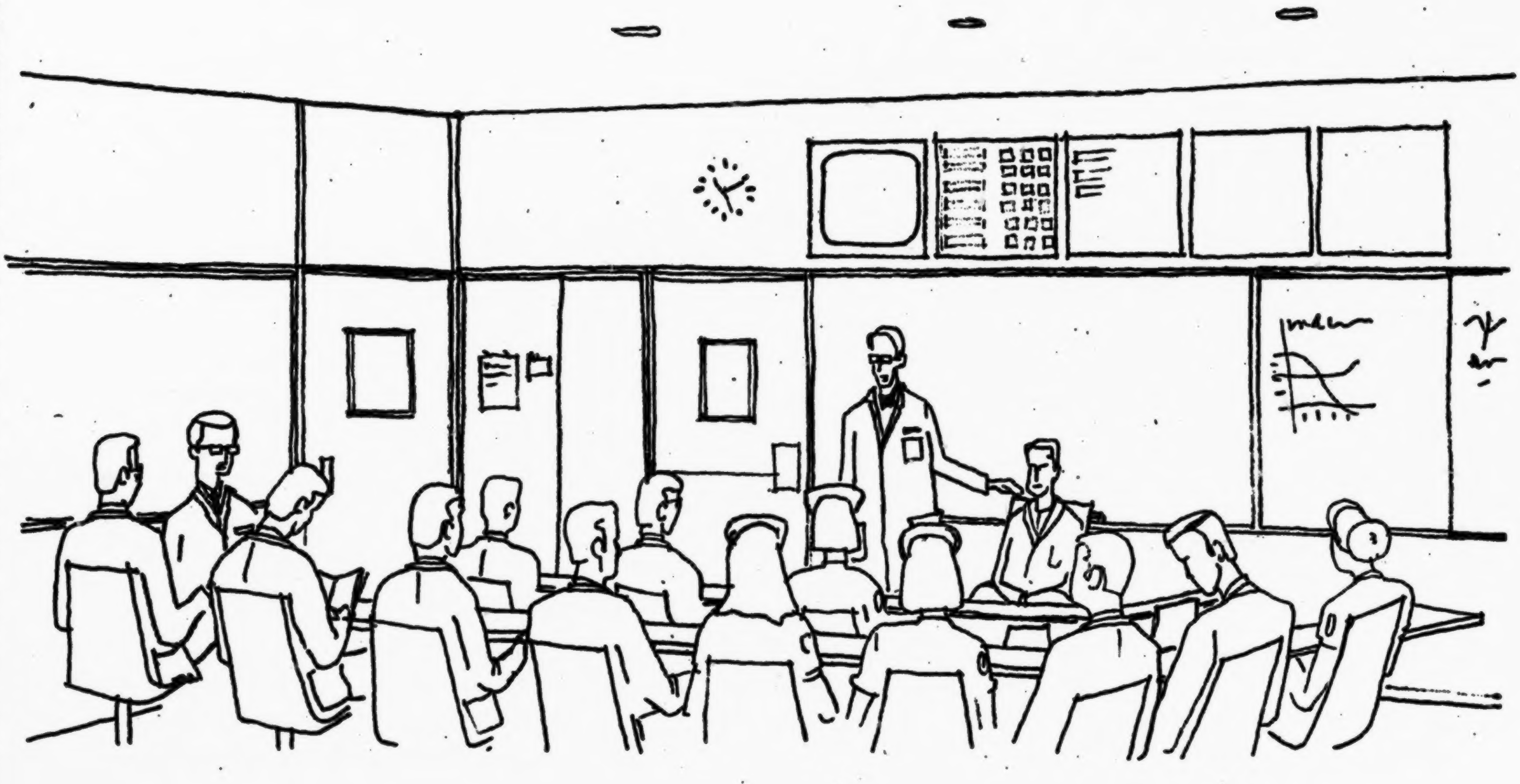
Four alternatives are indicated:

On a nursing unit

1. *Provision of a laboratory in each nursing unit:* The most basic clinical laboratory requires 150 to 200 sq. ft. of space, regardless of how few persons are to use it at any one time. It is difficult to imagine enough utilization in a nursing unit to justify the allocation of such space, and moreover, the problems of servicing, maintenance, and provision of supervisory staff for so many laboratories are generally prohibitive. This alternative is therefore *not* recommended.

S-1

HEALTH SCIENCES CLASSROOM



INTERIOR PERSPECTIVE

S-I

HEALTH SCIENCES CLASSROOM

PURPOSE:

To provide a multi-discipline classroom appropriate for educational functions involving the personnel on a nursing floor in groups too large or functions inappropriate for the nursing unit conference room. The classroom should permit the demonstration of patients and equipment; it should be well-planned space, designed to make teaching and learning — and communication — efficient, stimulating and productive.

PRINCIPAL USES:

- instruction involving the presentation of information in a variety of forms.
- instruction involving the presentation of a patient, either bedridden, ambulant or in a wheel chair.
- teaching rounds involving the personnel of the nursing units on the floor.
- scheduled classes of health sciences personnel from all over the hospital — nursing aides, dieticians, social workers, etc.
- inter-disciplinary classes involving various types of personnel from the units on the floor.
- patient and patient-family training and information sessions.
- hospital personnel in-service educational programs.
- continuing and post graduate education and training.

USERS:

From the nursing units on the floor —
- residents (2-4 from each nursing unit on the floor)
- student clerks (4-6 from each nursing unit on the floor)
- nursing staff and trainees (4-6 from each nursing unit on the floor)
- health science trainees (2-4 from each nursing unit on the floor)

Others:
- staff physicians (2-3)
- consultants (1-2)
- practitioners (post graduate education)
- hospital personnel (for in-service training)
- patient and patient-family groups
- classes of health science trainees

QUANTITY:

One on each nursing floor (unless a service-related teaching room is scheduled for the floor).

SPACE REQUIREMENTS:

- allow a patient in bed to be brought in and located for observation by all participants.
- allow pieces of equipment and apparatus to be brought in and demonstrated.
- accommodate 20 to 30 persons depending on the number of nursing units on the floor and the type and extent of educational programs. (On an average, the capacity will be based on 8 to 10 persons per nursing unit on the floor.)
- adjunct facilities
  - — equipment storage — an area for the storage of projectors and other instructional equipment used in the classroom and in the conference rooms in the nursing units.
  - — patient preparation — a room for readying and holding patients used in demonstrations; opens directly into the classroom.

SIZE:

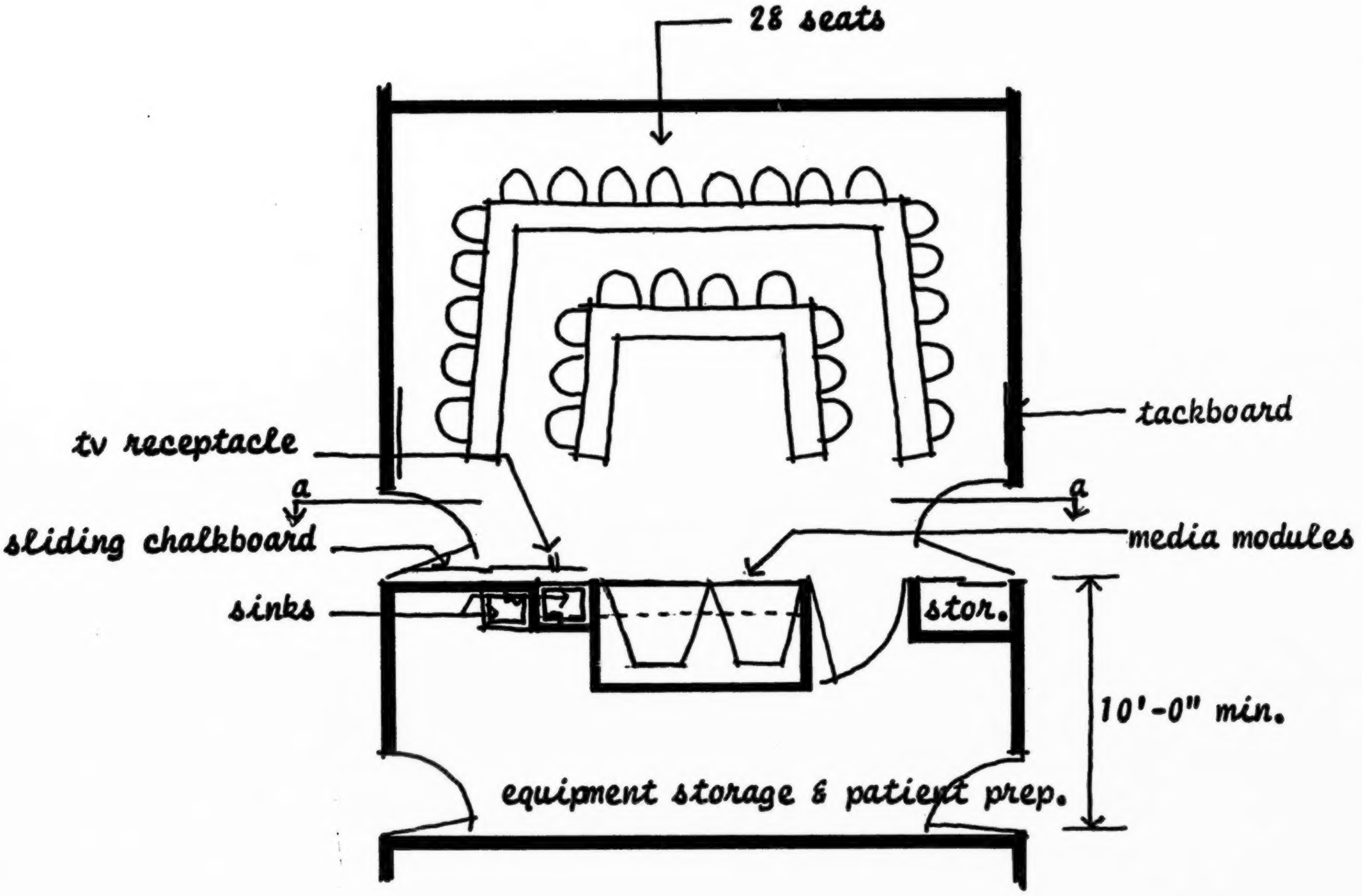
- classroom
  - — minimum recommended area for 20 occupants 300 sq. ft.
  - — minimum recommended area for 30 occupants 450 sq. ft.
- equipment storage 120 sq. ft.
- patient preparation 120 sq. ft.

LOCATION:

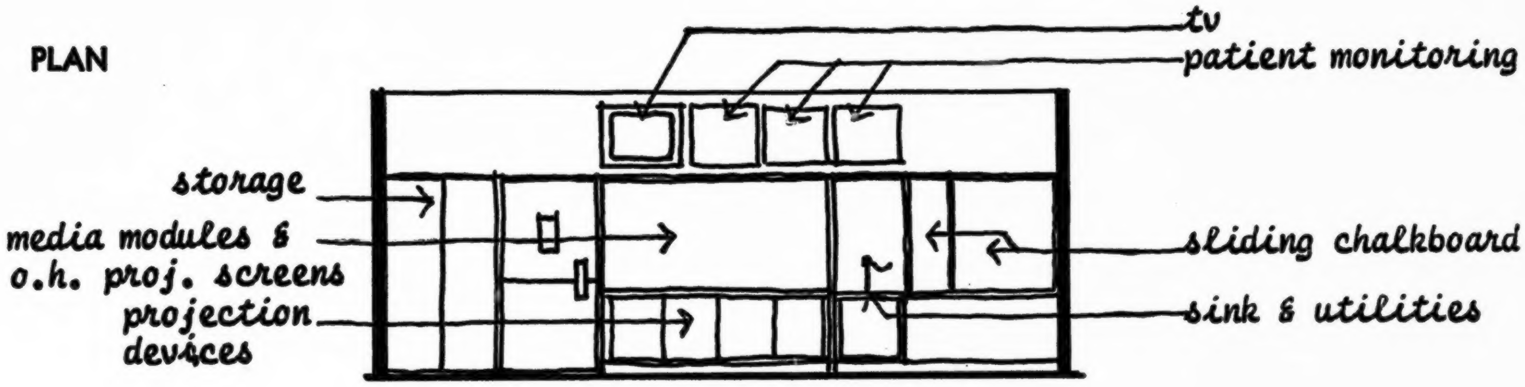
On the nursing floor between the nursing units, and adjacent to major circulation paths between units and between floors.

S-1

HEALTH SCIENCES CLASSROOM


28 seats
tackboard
tv receptacle
a
a
sliding chalkboard
media modules
sinks
stor.
10'-0" min.
equipment storage & patient prep.

PLAN


tv
patient monitoring
storage
media modules &
o.h. proj. screens
sliding chalkboard
projection
devices
sink & utilities
0
5
10

ELEVATION OF FRONT WALL SECTION A-A

S-I

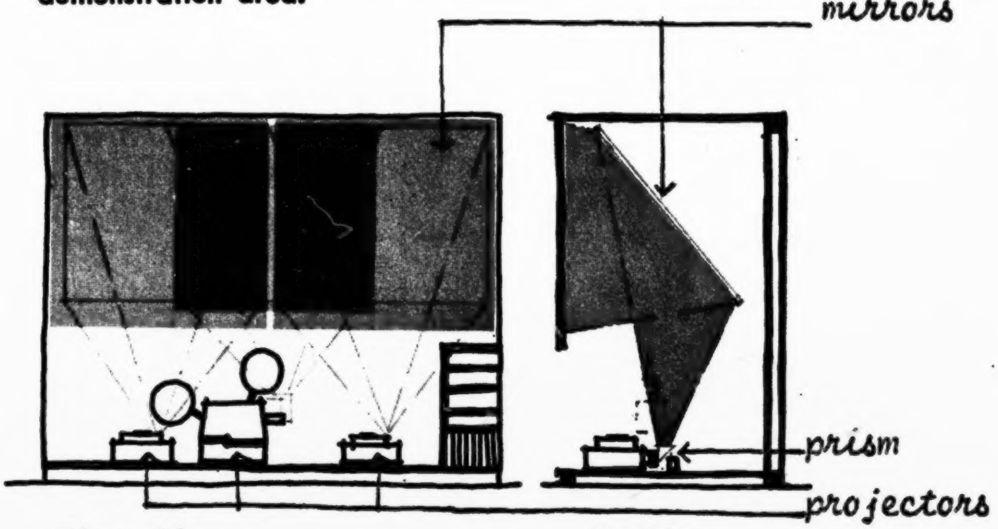
HEALTH SCIENCES CLASSROOM

FURNISHINGS AND EQUIPMENT:

- fixed, continuous counters with loose seats (counter arranged to encourage interaction and to focus on any patient or apparatus being demonstrated)
- chalkboard and tackboard surfaces
- overhead projector and screen surfaces
- film and slide projectors included in "media-module" with screen surface also used as film illuminator
- 27" TV receiver — wall mounted as needed for adequate coverage
- receptacle for TV origination
- instructors' portable lectern
- sink
- basic utilities — water, oxygen, suction, monitoring devices

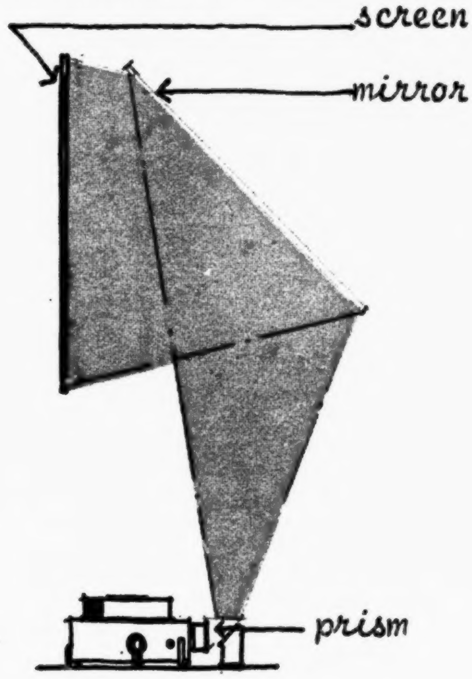
LIGHTING:

Availability of two overall levels — 60 to 10 footcandles — with supplementary display lighting on writing and task surfaces and on the demonstration area.

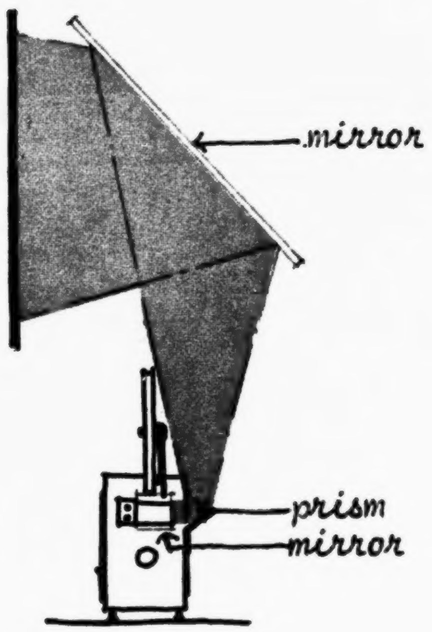


Elevation *Section*

DETAILS OF MEDIA MODULE



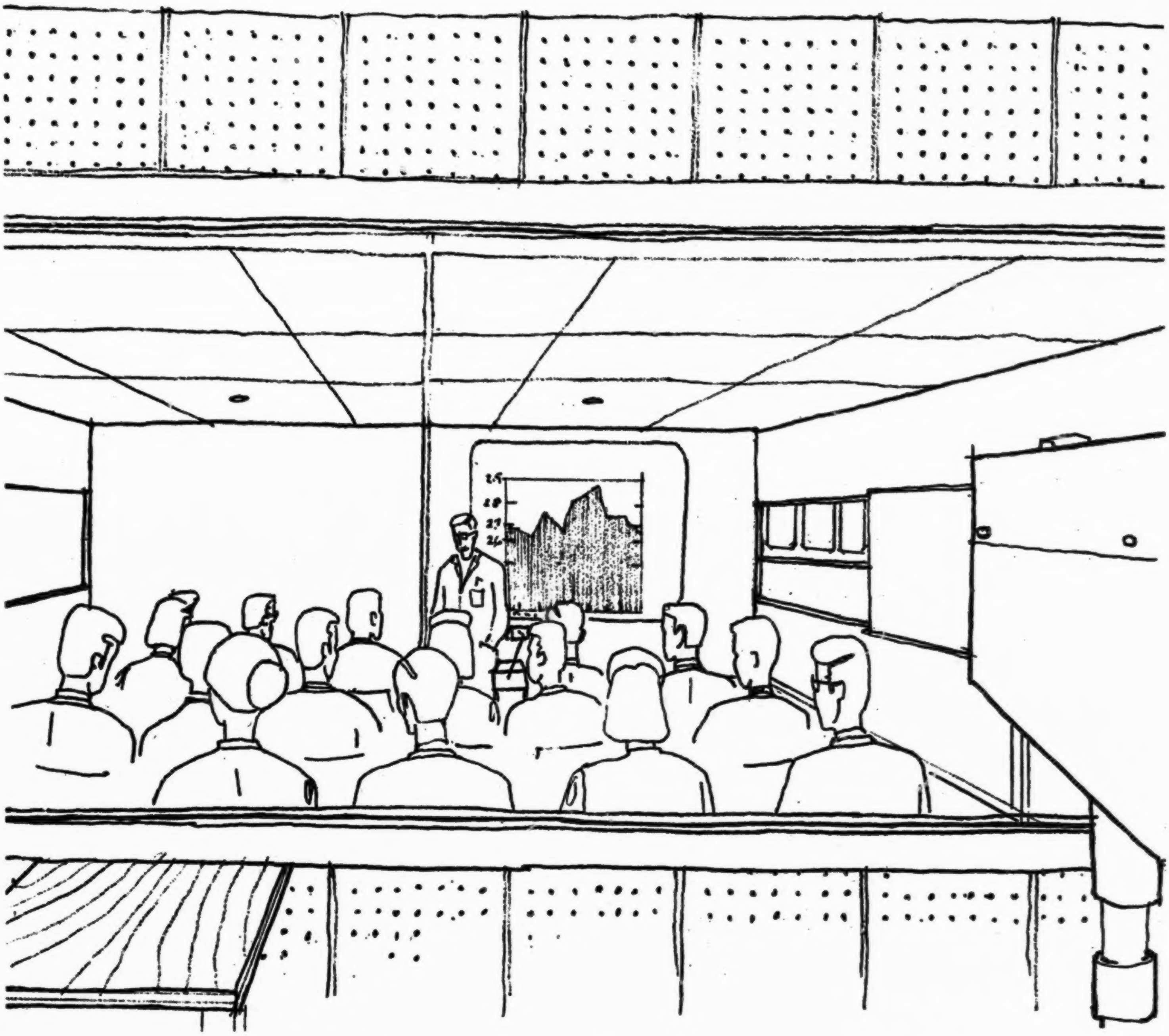
35 mm projection



16 mm projection

S-2

HEALTH SCIENCES CLASSROOM — PSYCHIATRY



INTERIOR PERSPECTIVE

S-2

HEALTH SCIENCES CLASSROOM — PSYCHIATRY

PURPOSE:

This facility is an alternate to S-1 and is developed specifically for psychiatric nursing floors to provide a room which can be subdivided and used for group therapy sessions, as well as for classroom functions. It should have the character of two well-appointed therapy rooms which can be opened together to create a single, comfortable classroom.

PRINCIPAL USES:

- instruction involving the presentation of information in a variety of forms, and the presentation of a patient either ambulant or in a wheel chair.
- teaching rounds involving the personnel of the psychiatric nursing units on the floor.
- scheduled classes of health science personnel from all over the hospital — nursing aides, dieticians, social workers, etc.
- inter-disciplinary classes involving various types of personnel from the units on the floor.
- patient and patient-family training and information sessions.
- hospital personnel in-service educational programs.
- continuing and post graduate education and training.
- group therapy sessions of 8 to 12 persons each.
- interview sessions with a single patient and a small group of doctors, students, and trainees.

USERS:

From the nursing units on the floor —

- residents (2-4 from each nursing unit on the floor)
- student clerks (4-6 from each nursing unit on the floor)
- nursing staff and trainees (4-6 from each nursing unit on the floor)
- health science trainees (2-4 from each nursing unit on the floor)
- psychology trainees (2-4 from each nursing unit on the floor)
- patients (in groups of 8 to 12)

Others:

- staff physicians (2-3)
- consultants (1-2)
- practitioners (post graduate education)
- hospital personnel (for in-service training)
- patient and patient-family groups
- classes of health science trainees

QUANTITY:

One for each psychiatric nursing floor (unless a service-related teaching room is scheduled for the floor)

SPACE REQUIREMENTS:

- accommodate a group of 20 to 30 in an instructional setting which may focus on a patient. (The capacity will depend on the number of nursing units on the floor and the type and extent of the educational programs.)
- accommodate 2 groups of 8 to 12 persons for group therapy.
- adjunct facilities
  - — equipment storage — projectors and other instructional equipment used on the floor and in the classroom.
  - — observation room — either space for TV orgination or physical observation by 3-4 persons.

SIZE:

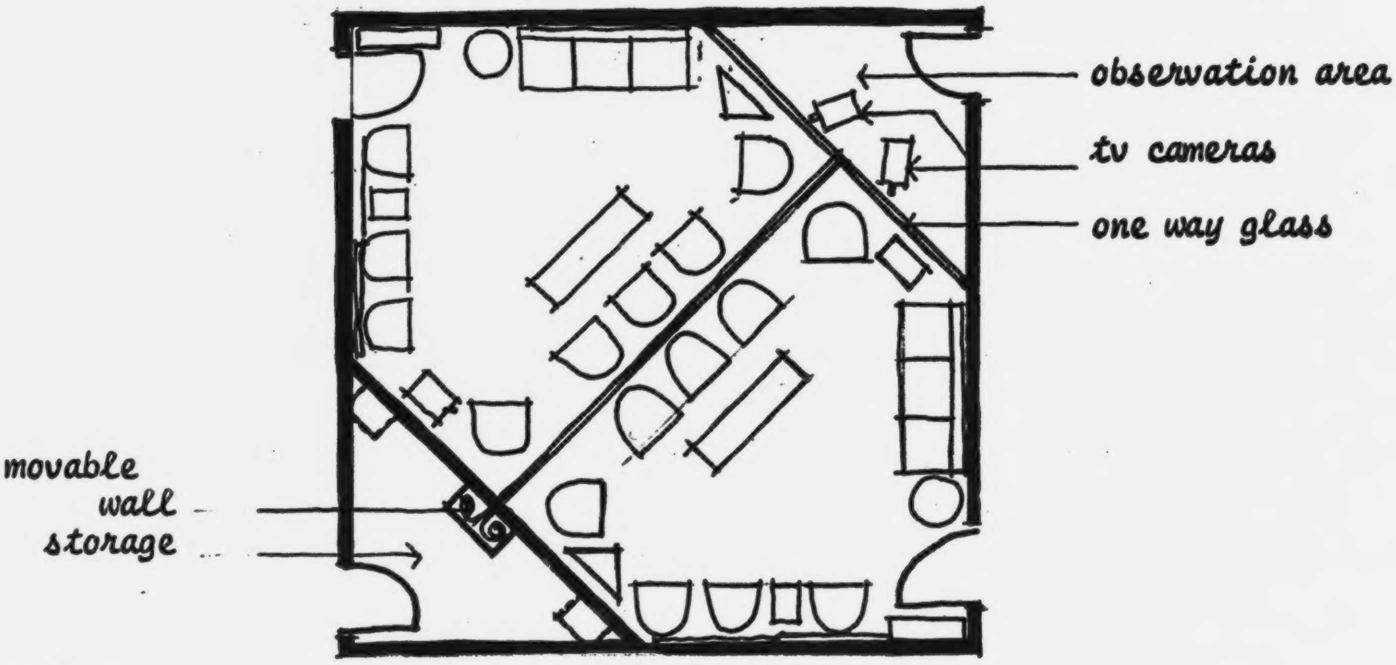
- classroom
  - — minimum recommended size for 20 persons 440 sq. ft.
  - — minimum recommended size for 30 persons 660 sq. ft.
- equipment and table storage 50 sq. ft.
- observation room 50 sq. ft.

LOCATION:

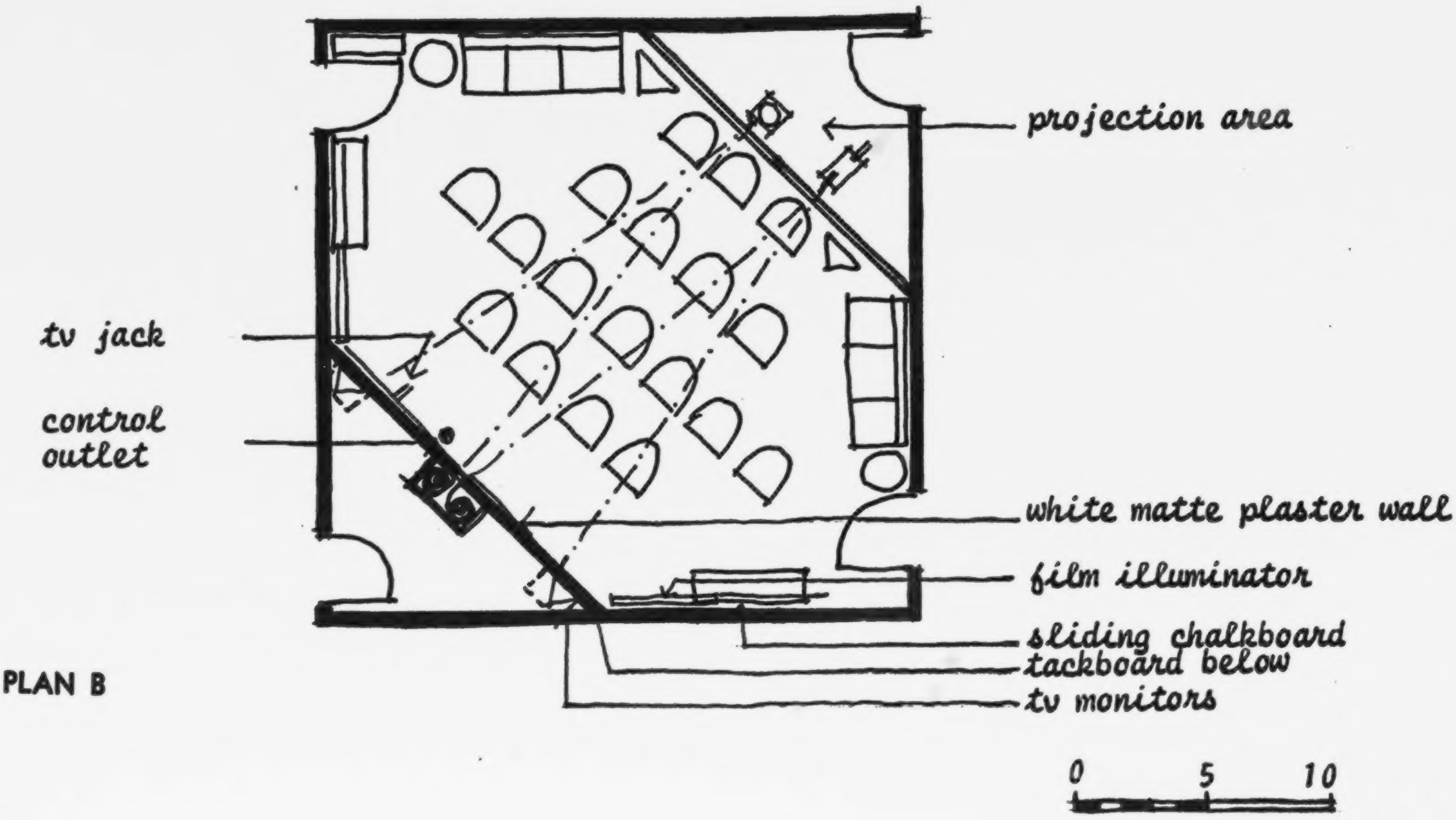
On the nursing floor between the nursing units, and adjacent to major circulation paths between units and between floors.

S-2

HEALTH SCIENCES CLASSROOM — PSYCHIATRY


observation area
tv cameras
one way glass
movable wall
storage

PLAN A


projection area
tv jack
control outlet
white matte plaster wall
film illuminator
sliding chalkboard
tackboard below
tv monitors
0
5
10

PLAN B

S-2

HEALTH SCIENCES CLASSROOM — PSYCHIATRY

FURNISHINGS AND EQUIPMENT:

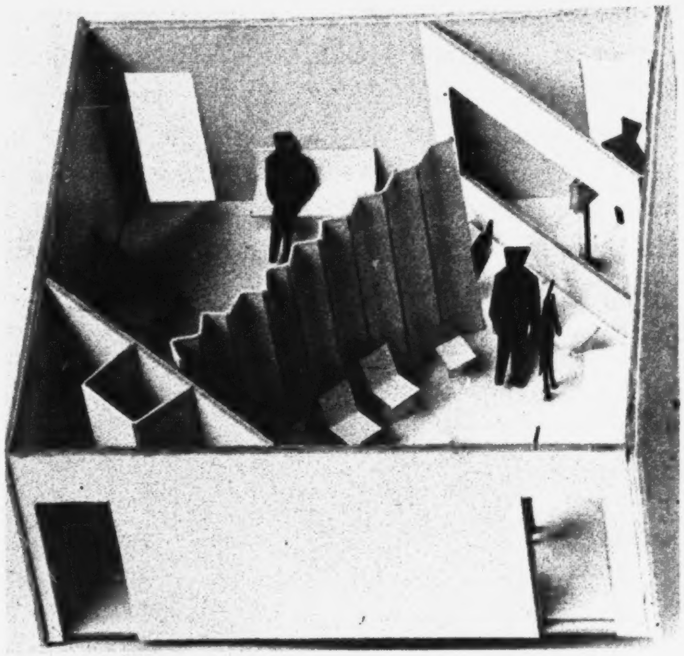
- chairs which can be arranged for class sessions or therapy sessions. (The chairs must be of a comfortable, upholstered lounge type)
- folding partition of 40 decibel rating
- audio pick-up system with distribution to observation room
- chalkboard and tackboard surfaces
- film illuminators
- projectors and screen surfaces
- 27" TV receivers — wall mounted
- TV origination including recessed cameras
- sink
- portable lectern

LIGHTING:

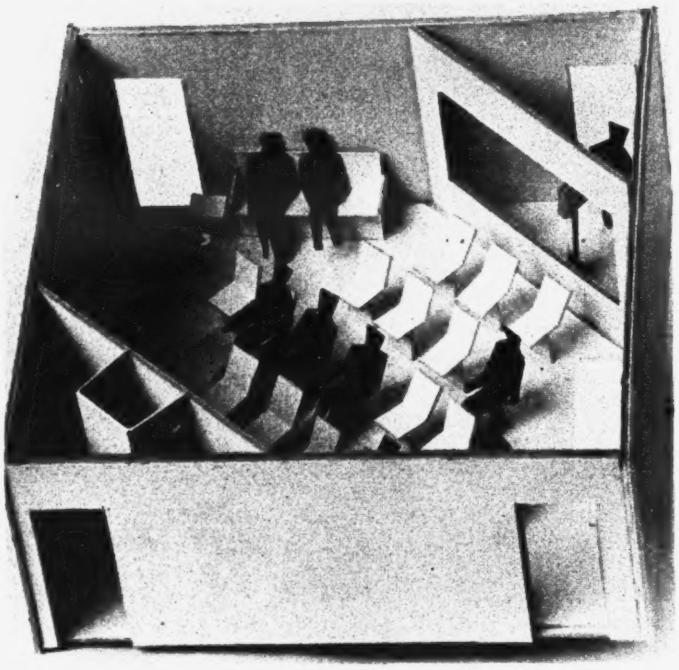
- availability of varying levels and characteristics through use of a dimming system which can be separately controlled for each half of the room.
- supplementary accent lights on demonstration area and display surfaces.

ACOUSTICS:

- complete acoustical privacy in each half when space is used as two therapy rooms.
- acoustical privacy when room is used as classroom.



VIEW OF MODEL A



VIEW OF MODEL B

On a nursing floor

2. ***Provision of a laboratory on each nursing floor:***
   This seems a reasonable solution if the medical school feels that clinical laboratory experiences are important and should be readily available and accessible. Such an approach is expressed by the following laboratory design, identified as facility S-3. The problems of maintenance and servicing can be satisfactorily resolved and supervision can be provided from the main laboratory by circulating staff.

Related to a service

3. ***Provision of a laboratory for each major bed service:***
   If the medical school gives less emphasis to clinical laboratory experiences, but still feels that they should be available, clinical laboratories can be provided as part of the service-oriented facilities. Such an approach is expressed by providing the type of clinical laboratory shown as part of the resource sub-center (facility S-5) which is provided for each major bed service — medicine, surgery, and neuro-psychiatry.

As part of the main labs

4. ***Provision of student laboratory facilities as part of the main hospital laboratory:***
   This approach requires that designated areas of the main laboratory be made available for student-trainee use; the ready availability of technical assistance and the ease of maintenance and servicing favor this approach.

Analysis of the alternates

Of these alternatives, the fourth is the easiest to implement administratively, although it will probably not fully satisfy the educational objectives of most medical schools. By the provision of service-related laboratories (alternate #3) a degree of accessibility is reintroduced. It is recommended therefore, that laboratories be provided as part of the resource sub-center as shown in facility S-5. The decision to provide the floor laboratories instead (S-3) should be based on the educational objectives and needs of the affiliated medical school. In view of the marked trend in the direction of expanded clinical research and the integration of basic and clinical sciences, the provision of such floor laboratories, irrespective of present educational needs, would be a logical anticipation of future needs.

Medical Service Facilities

Size of the medical service

The size of the medical service in a new *VA* hospital is related to its location and mission, but usually contains ⅕th to ⅓rd of the total beds, or from 200 to 320 beds. This represents 5 to 8 nursing units of 40 beds each distributed on 2 to 4 floors.

Other facilities needed

A floor-related Health Sciences Classroom such as facility S-1 should occur on each nursing floor of the medical service, and in addition, other educational facilities should be provided within each medical nursing unit, as will be explained in the next section. However, there are certain *service-wide* functions which require additional educational facilities.

Functions of the Service-Related Teaching Room

Several times a week the medical service conducts teaching rounds for the presentation and discussion of a case involving the residents, medical students, consultants, and staff of the medical service. Sometimes, these so-called "grand" or "service" rounds require a room where the service can meet together, where information and materials can be shown, and where a patient can be demonstrated. In addition, there is need for accommodating such functions as staff meetings and conferences, service-wide lectures and seminars, personnel training programs, scheduled classes of nurses, nurse aides, and other medical personnel, and training sessions for patients and patient families. All of these require a learning space larger than the floor-related classroom, yet smaller than the large teaching room (H-1), and it is to serve these purposes that the Service-Related Teaching Room (S-4) has been developed. It is fully described and illustrated in the description and programming data presented on pages 84 through 87.

Future needs for such a room

Present educational programs indicate the need for such a medical service teaching room and the bringing of the basic sciences into the clinical years suggests more and more need in the future for large group teaching rooms of this kind within the hospital. It also suggests the growing need for the other medical service facility — the resource sub-center.

Purpose of the Resource Sub-Center

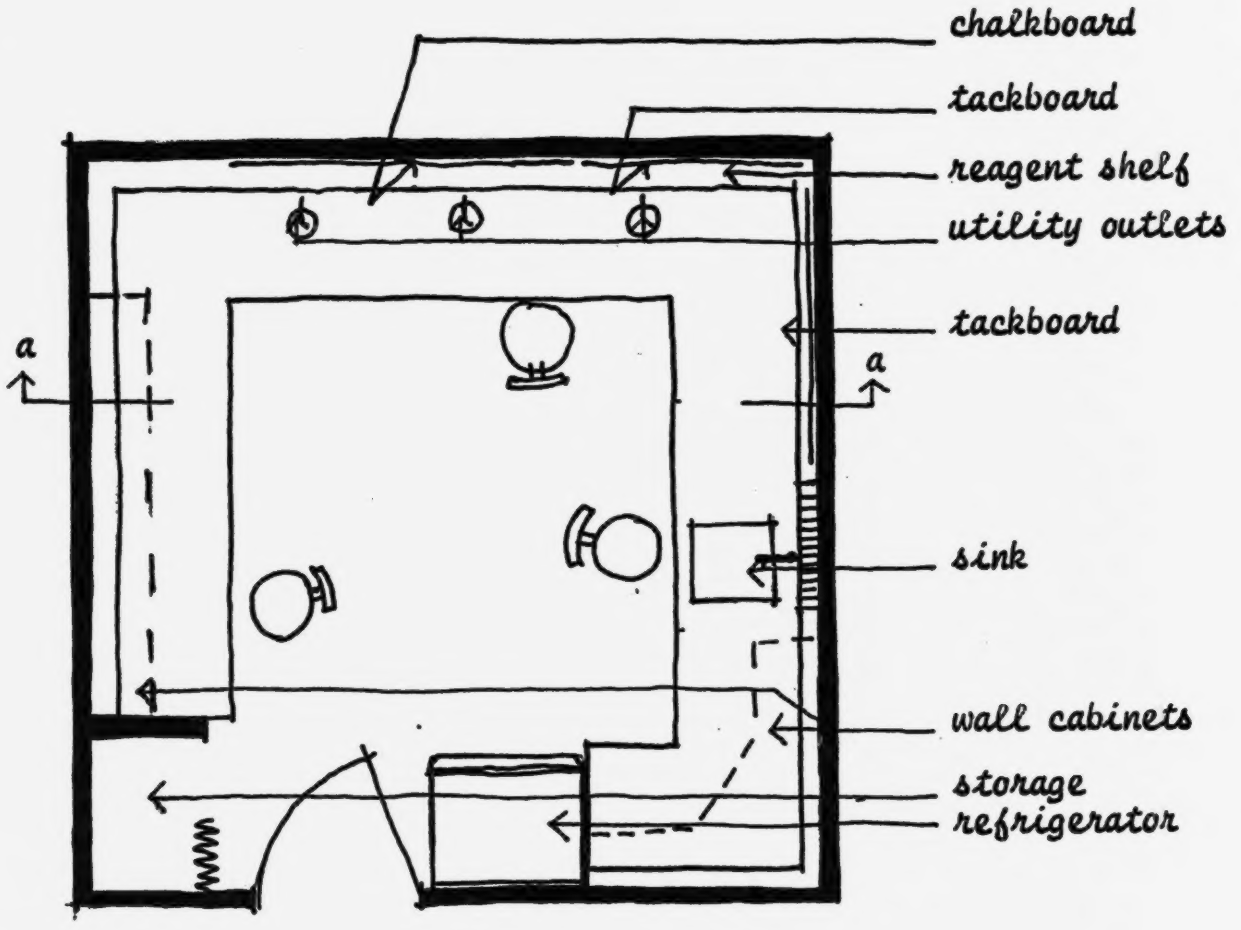
Towards encouraging individual responsibility for learning, the development of lifetime learning habits, and the informal interaction between persons and resources within the hospital, it is important that some learning resources are distributed throughout the hospital for ready availability and access. A service orientation seems most appropriate, and this has led to the development of the Resource Sub-Center (S-5) which is associated with the teaching room as part of the medical service complex. This resource sub-center, which is fully described on pages 88 to 91 is a sub-center, and does not replace the hospital-wide resource facility described previously.

Combination of facilities to serve the medical service

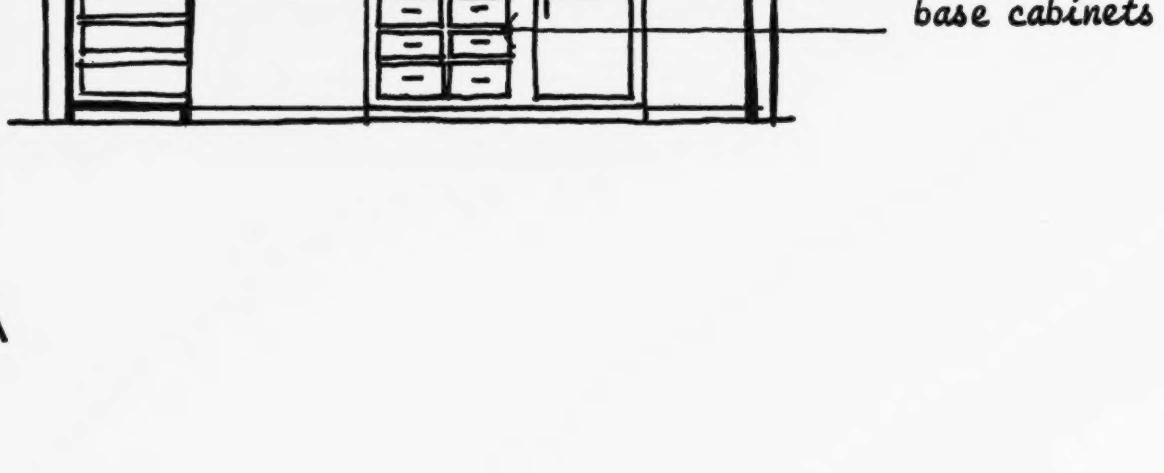
Finally, there are several reasons why the teaching room, the resource sub-center, and the service offices should be physically related. Resources stored in the sub-center will often be used in the teaching room, and consultants and staff will be located near the service's educational facilities. The combination plan of teaching room and resource sub-center, which would be related to the office, staff offices, and secretarial area, is shown on pages 92 and 93.

S-3

STUDENT CLINICAL LABORATORY


chalkboard
tackboard
reagent shelf
utility outlets
tackboard
a
a
sink
wall cabinets
storage
refrigerator

PLAN


audio
chalkboard
tackboard
base cabinets

SECTION A-A

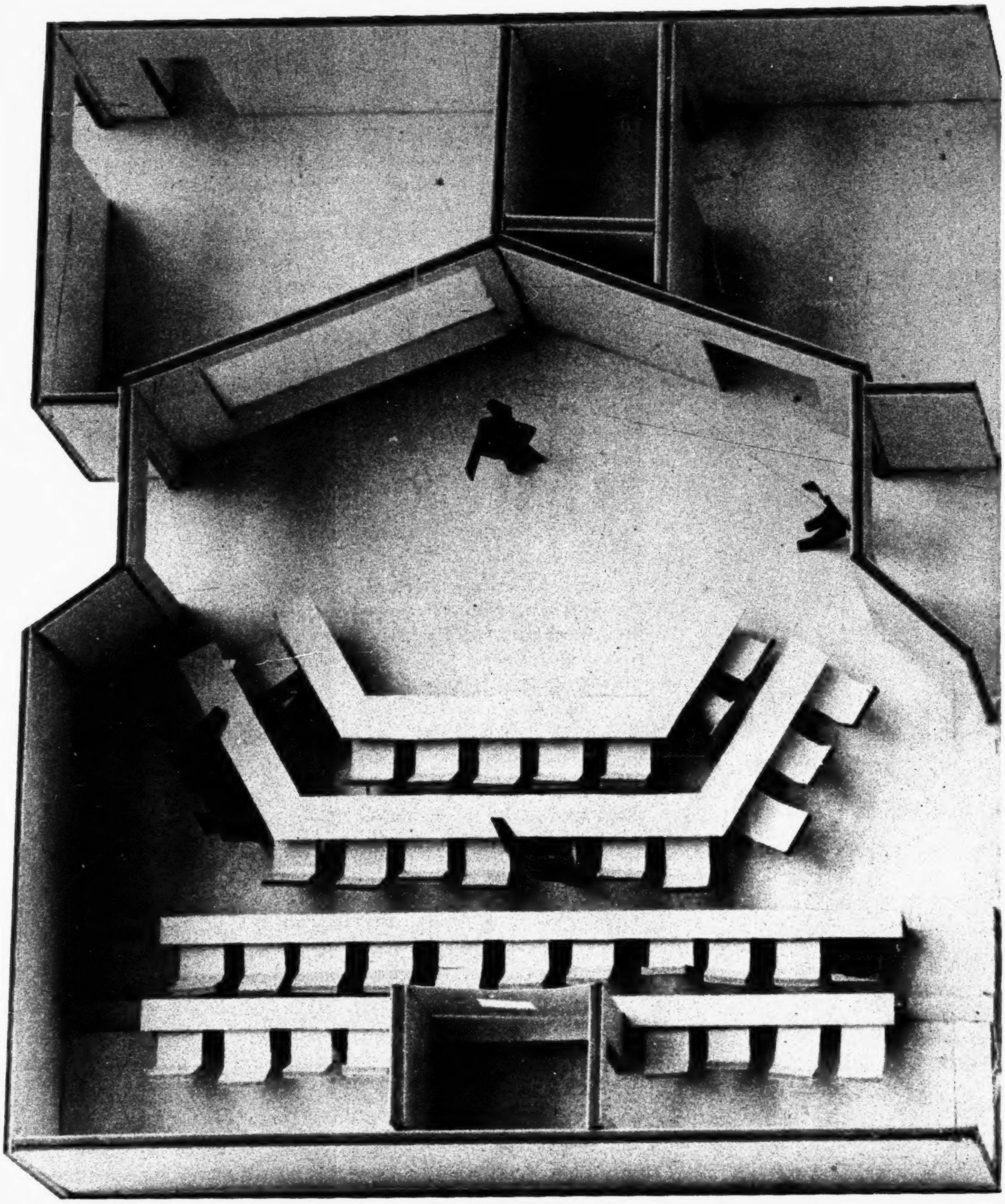
S-3

STUDENT CLINICAL LABORATORY

PURPOSE:	To provide a readily accessible laboratory where residents, students and appropriate trainees may perform basic clinical laboratory procedures both as a learning exercise and as a requirement of improved patient care. (The decision to provide this floor-related facility will be based on the educational philosophy and needs of the affiliated school.)
PRINCIPAL USES:	• to verify clinical laboratory findings. • for performing basic laboratory tests where immediacy of results is an important factor or during hours when the main laboratory is not operating. • for conducting tests in conjunction with a detailed study or clinical research investigation. • for student use when developing "write-ups" or compiling cases for presentation. • as a place for residents, students and appropriate technicians to develop technical skills. • as a clinical research laboratory.
USERS:	• residents (2-4 from each nursing unit on the floor) • students and student clerks (4-6 from each nursing unit on the floor) • health science trainees (1-2 from each nursing unit on the floor) • research fellows • post-graduate fellows
QUANTITY:	One for each nursing floor unless the service-related resource sub-center occurs on the floor.
SPACE REQUIREMENTS:	• accommodate the basic clinical laboratory equipment • permit three to four persons to work simultaneously
SIZE:	• minimum recommended width 10 feet • minimum recommended area 200 sq. ft.
LOCATION:	On the nursing floor, outside the nursing units, but adjacent to major circulation between the units.
FURNISHINGS AND EQUIPMENT:	Typical of those needed to perform basic laboratory procedures.
LIGHTING:	Overall illumination of 60 to 80 footcandles.
ATMOSPHERIC CONTROL:	Potential for complete control — air conditioning, air exchange, humidity control and pollution control.

S-4

SERVICE-RELATED TEACHING ROOM



PHOTOGRAPH OF MODEL

S-4

SERVICE-RELATED TEACHING ROOM

PURPOSE:

To provide an instructional facility for service-wide use and for multi-discipline use by other services, departments, and inter-disciplinary programs. It is an environment for efficient and productive communication and learning.

PRINCIPAL USES:

- service-wide conferences, lectures, and colloquia
- staff meetings and conferences
- service-wide rounds and similar teaching functions
- instructional activities involving the presentation of information in a variety of forms, the demonstration of a patient, and the demonstration and manipulation of apparatus and equipment. These would include classes of:
  - — student clerks (service-wide)
  - — clerks and residents (service-wide)
  - — nurses, nursing aides, and nursing assistants
  - — other health science personnel
  - — inter-disciplinary groups
  - — various groups of hospital employees as part of the personnel training program
  - — patients and families of patients

USERS:

- residents (10-30)
- student clerks (30-50)
- nursing staff and trainees (20-60)
- health science trainees (10-30)
- staff physicians (4-10)
- consultants (1-4)
- practitioners (post-graduate education)
- hospital personnel (in-service training)
- patients and families

QUANTITY:

One for each major bed service — i.e., medicine, surgery, and neuropsychiatry. (Maximum of 3 per VA teaching hospital).

SPACE REQUIREMENTS:

- accommodate 30 to 60 persons depending on the size of the service and the type and extent of the educational programs.
- permit a bed patient to be brought in and positioned with any necessary apparatus with optimum viewing by at least half the occupants.
- allow various pieces of apparatus and equipment to be brought in and demonstrated.
- provide for panel presentation and discussion of cases.
- adjunct spaces —
  - — projection and storage area — space for housing and readying rear projection equipment and for temporary storage of materials.
  - — patient preparation area — space for readying and holding patients used in demonstrations and presentations. (Opens directly into teaching room.)

SIZE:

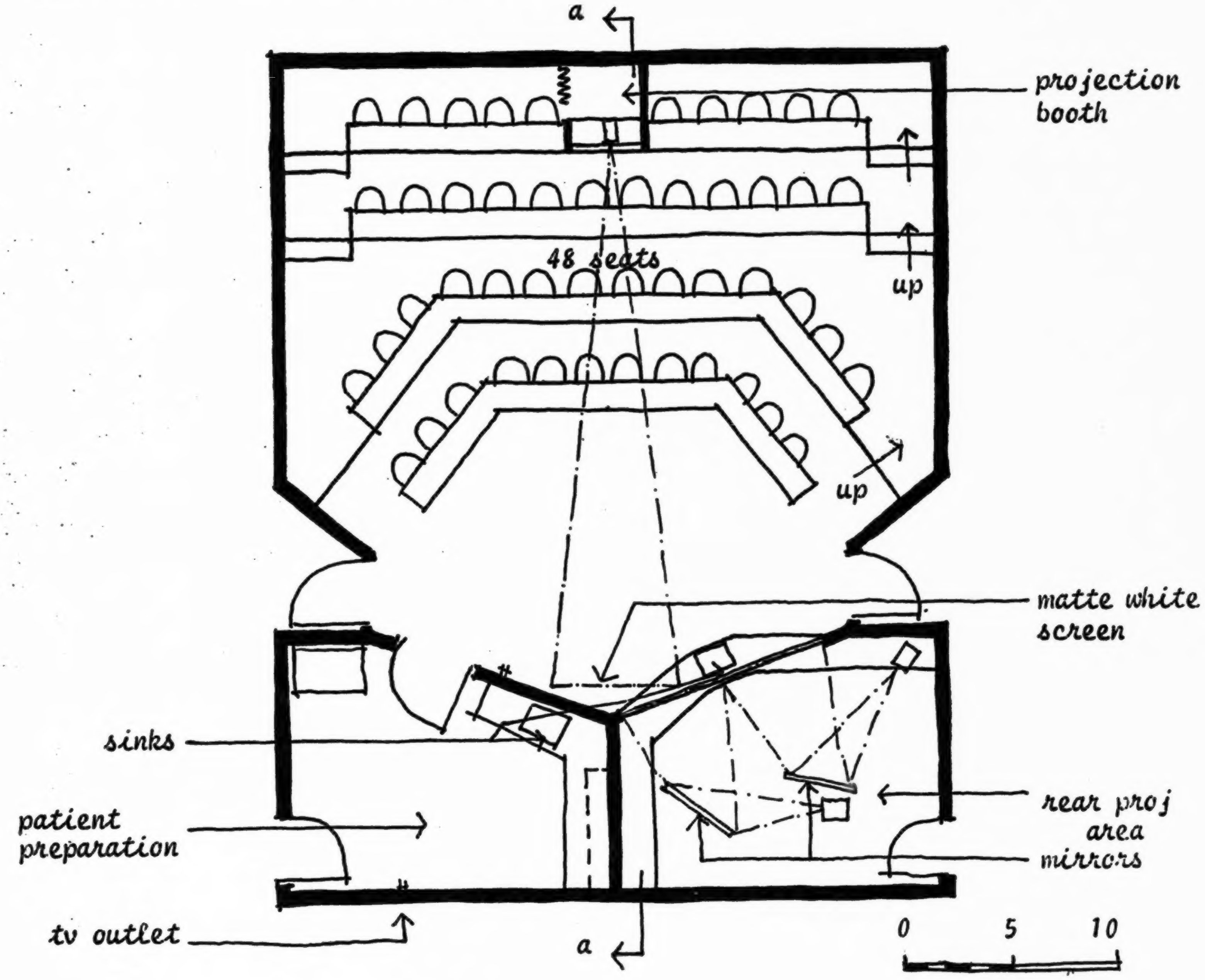
- teaching room — minimum recommended area
  for 30 occupants 660 sq. ft. minimum recommended area
  for 60 occupants 1020 sq. ft.
- projection and storage area — 150 sq. ft.
- patient preparation area — 150 sq. ft.

LOCATION:

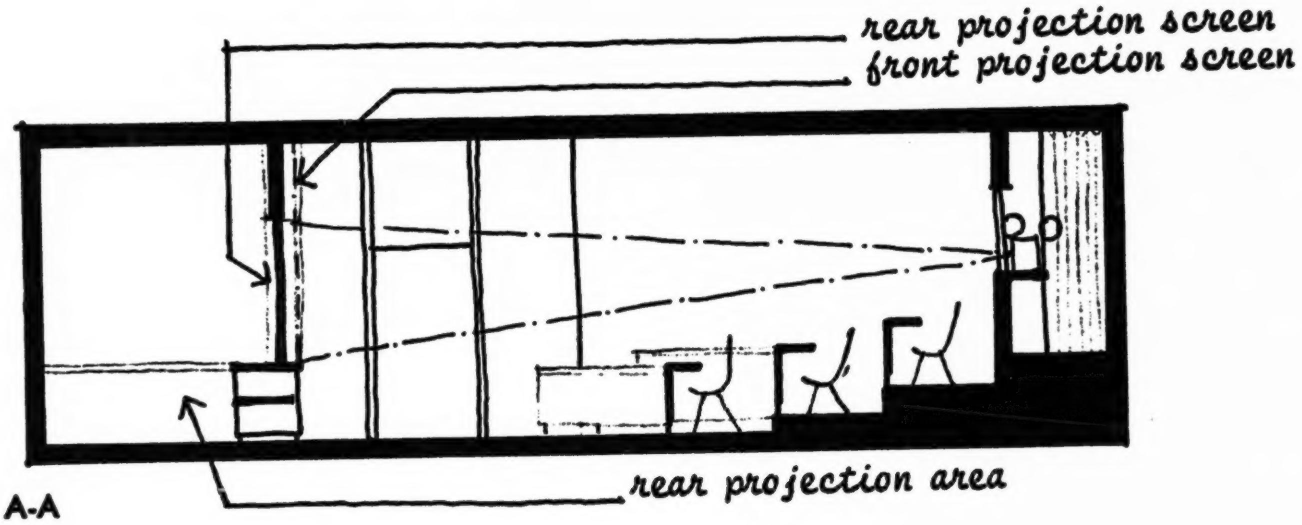
- within the service and related to other service-wide facilities — chief's office, staff offices, secretarial area and resource sub-center (S-5).
- adjacent to major circulation paths within the service and between floors.

S-4

SERVICE-RELATED TEACHING ROOM


a
projection booth
48 seats
up
up
matte white screen
sinks
patient preparation
rear proj area
mirrors
tv outlet
a
0
5
10

PLAN


rear projection screen
front projection screen
rear projection area

SECTION A-A

S-4

SERVICE-RELATED TEACHING ROOM

FURNISHINGS AND EQUIPMENT:

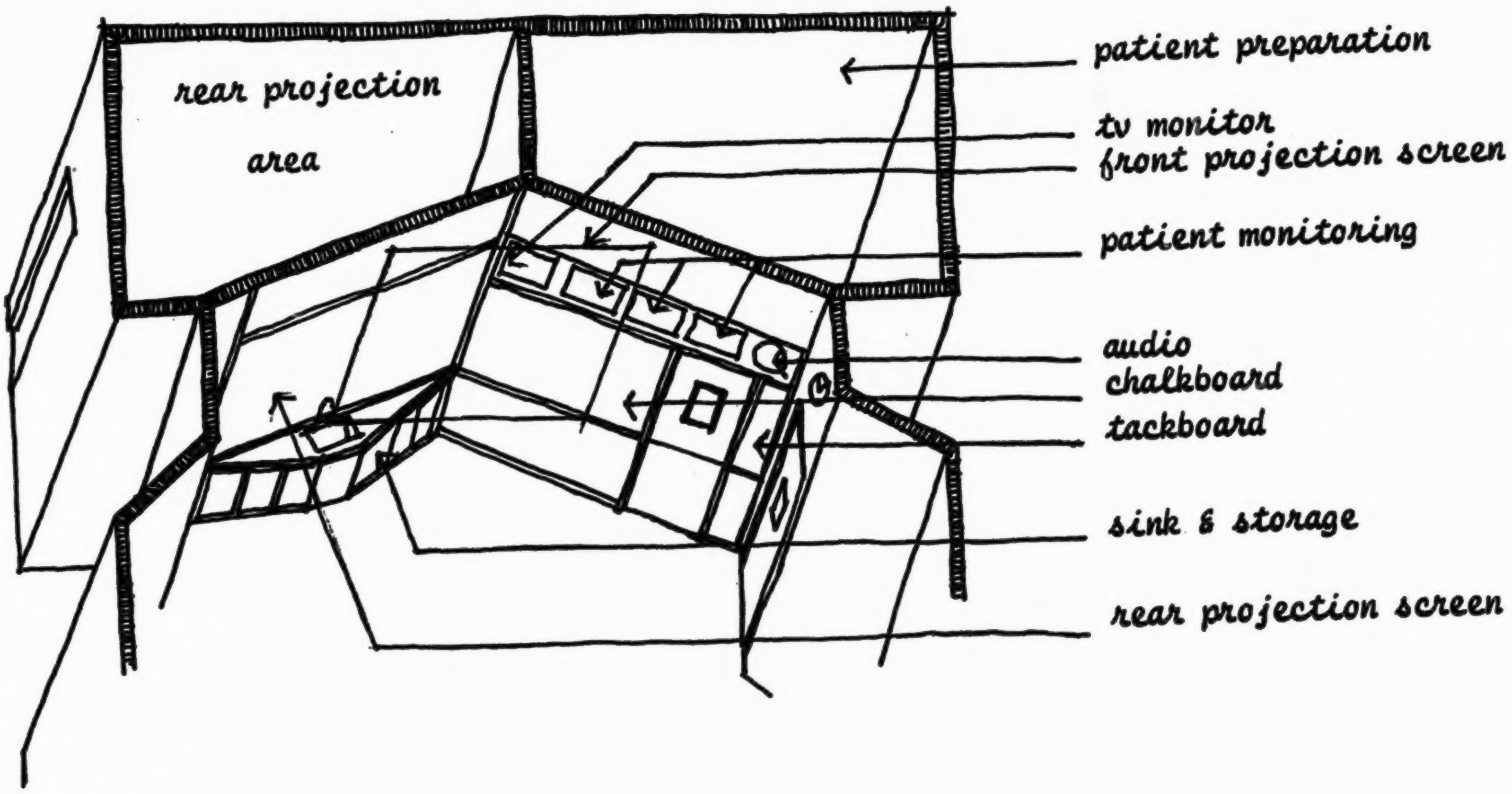
- seating — continuous counter tops with loose seats or fixed seats with folding tablet arms
- chalkboard-tackboard surfaces
- overhead projection and screen surfaces
- rear projection systems for slide and motion picture usage
- TV receivers (wall-mounted) as required for coverage
- receptacle for TV origination, and camera stand for TV magnification system
- patient monitoring display panel
- sink (also in patient preparation room)
- service and utility connections — oxygen, suction, power, etc.
- storage cabinets (in patient preparation room)

LIGHTING:

- directional system arranged to provide two levels of illumination
  - —low level which will spill no more than 2 footcandles of light on the screens
  - —high level of 40-60 footcandles on the writing surfaces
- supplementary lighting on display surfaces and demonstration area

ACOUSTICS: Shaped ceiling in larger rooms and absorptive rear wall surfaces in all rooms to permit interchange and discussion.

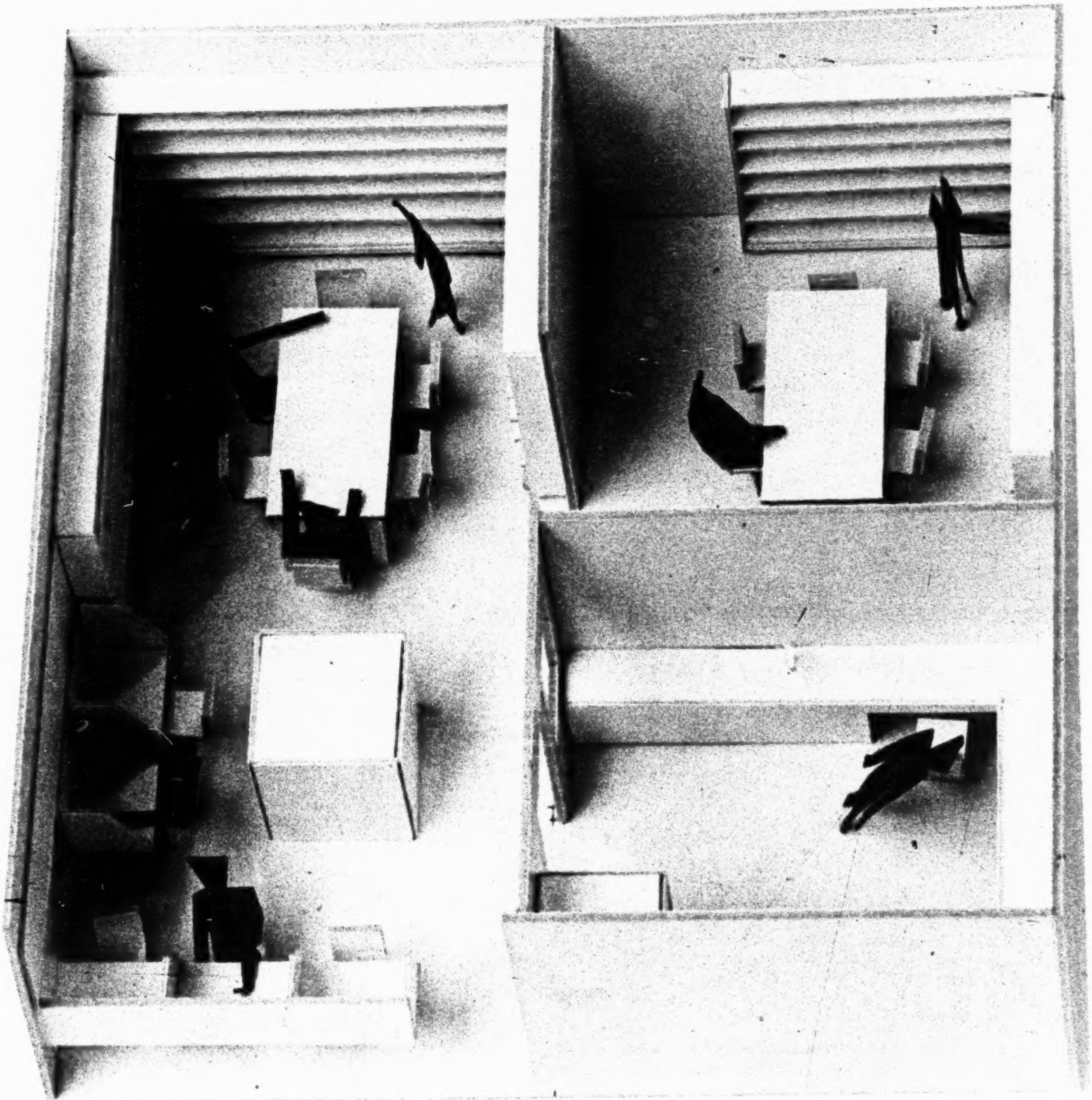
CLIMATE: Complete air-conditioning desirable.


rear projection area
patient preparation
tv monitor
front projection screen
patient monitoring
audio
chalkboard
tackboard
sink & storage
rear projection screen

VIEW OF TEACHING WALL

S-5

SERVICE RESOURCE SUB-CENTER



PHOTOGRAPH OF MODEL

S-5

SERVICE RESOURCE SUB-CENTER

PURPOSE:

To make learning resources readily accessible and usable in appropriate surroundings within each major bed service of the VA hospital.
The sub-center is planned and furnished to invite students and teachers to avail themselves of the resources and the use of its facilities on an informal, intermittent basis.

PRINCIPAL USES:

- to make many kinds of resources — reference books, texts, periodicals, case histories, films, slides, x-rays, records and reports, specimens — readily available within the nursing areas.
- to make available those resources particularly appropriate to the service and the needs of its personnel.
- to allow an opportunity for informal interchange between students, trainees, staff, and consultants of a particular service.
- to assist the teaching staff by making resources and references easily accessible and near the teaching room and classrooms.
- to provide a place for application of laboratory techniques and skills, both as a teaching device and as a means of improving patient care.
- to aid in the development of case presentations, classical cases and other special studies.
- to encourage the development of life-long habits of individual study and learning.
- to provide space for individual study, research, and case presentation.

USERS:

All residents, clerks, trainees, staff and consultants assigned to the particular service.
All others who have need of the particular resources available in the sub-center.

QUANTITY:

One for each major bed service — i.e., medicine, surgery and neuropsychiatry (maximum of 3 per VA teaching hospital)

SPACE REQUIREMENTS:

- provide for a total seated capacity of 15 to 30 persons depending on the size of the service and the type and extent of educational programs.
- components —
    - — resources storage and access area — resources of many kinds stored in appropriate ways
    - — using area — reference, study and work area
    - — lounge-conference area — a divisible space which will be part of the using area when not used for conferences
    - — clinical laboratory — facility in which students and trainees can perform basic clinical laboratory procedures.

SIZE:

Minimum recommended areas for total capacities of 15 persons and 30 persons:

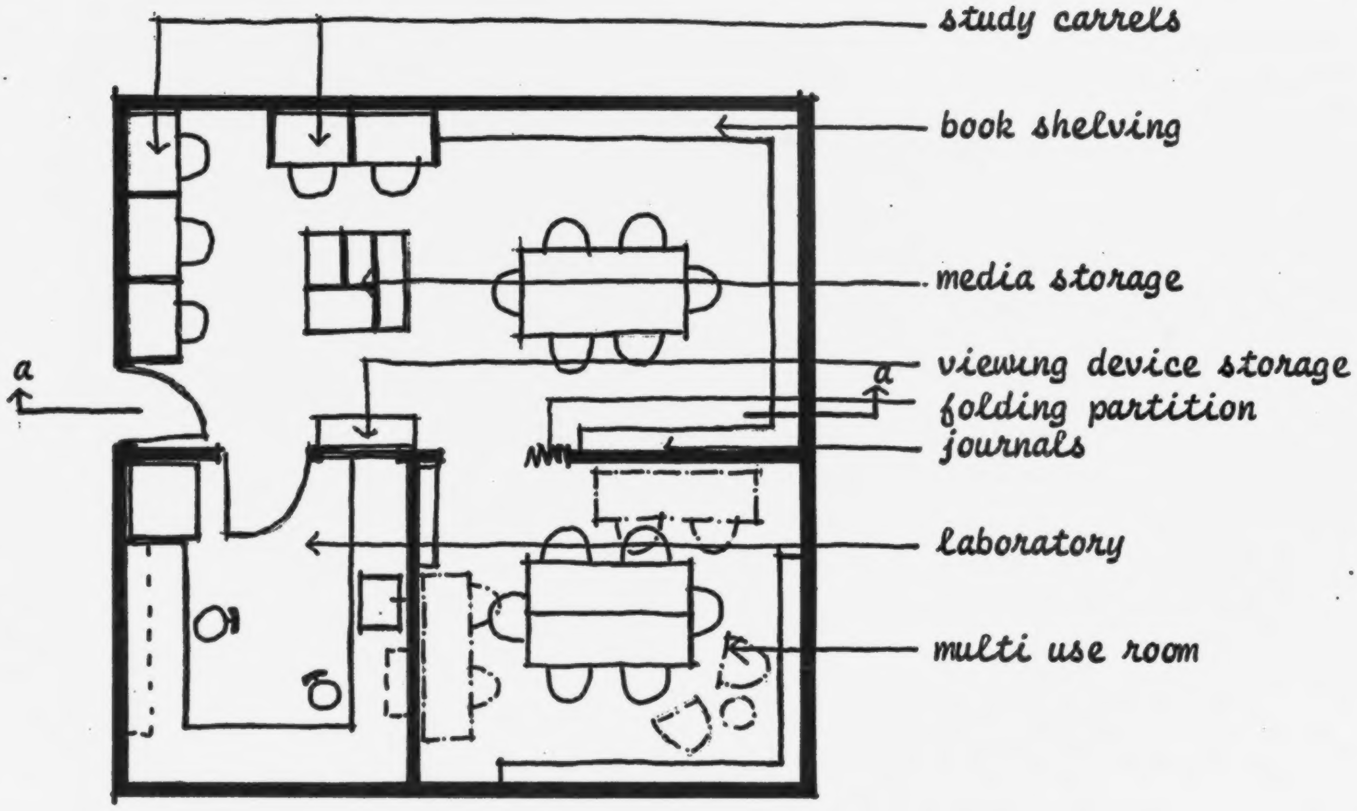
— resources storage, access and storage area — 216/532 sq. ft.
— lounge-conference area — 168/250 sq. ft.
— clinical laboratory — 120/120 sq. ft.

LOCATION:

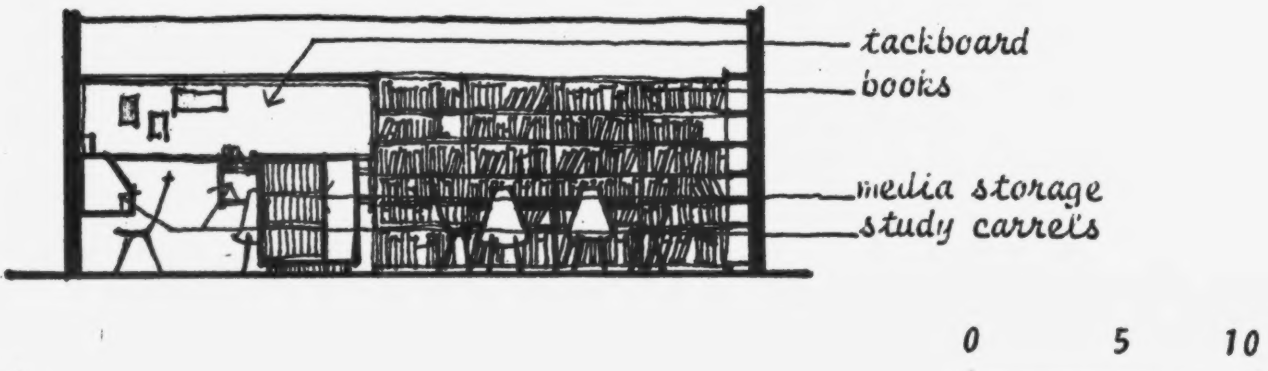
Related directly to the Teaching Room (S-4) as part of the service administrative facilities; easily accessible from all areas of the service and open 24 hours a day.

S-5

SERVICE RESOURCE SUB-CENTER


study carrels
book shelving
media storage
a
a
viewing device storage
folding partition
journals
laboratory
multi use room

PLAN


tackboard
books
media storage
study carrels
0
5
10

SECTION A-A

S-5

SERVICE RESOURCE SUB-CENTER

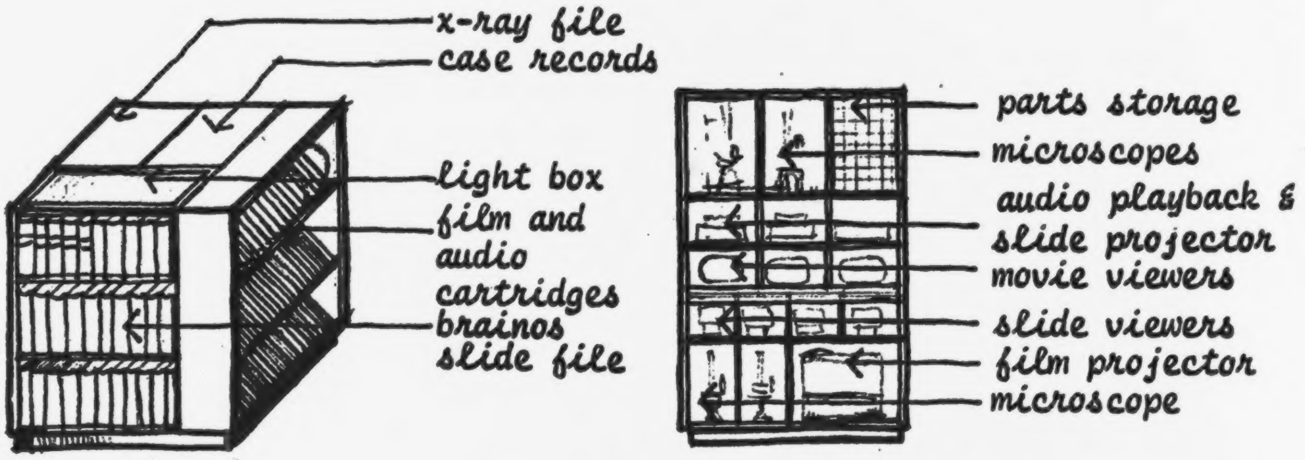
FURNISHINGS AND EQUIPMENT:

- resources storage and access area — book shelves; periodical racks; films, tapes, and slide cabinets; portable projection and sound equipment; x-ray film and record files, etc.
- using area — carrels for use of portable equipment and audio video communication systems, study-work carrels, dictating-listening-typing cubicles, lounge furniture, library tables and chairs, carpeting, bulletin and display panels.
- lounge-conference area — conference table (modular) and chairs, carpeting, folding partition between remainder of resource sub-center, TV monitors and use of portable projection and sound equipment.
- clinical laboratory — laboratory counters and cabinets, microscopes, centrifuge, refrigerator, sink, and laboratory services.

LIGHTING: Overall illumination of 30-40 footcandles with individual work lights at carrels and study stations.

ACOUSTICS: Acoustical isolation.

CLIMATE: Complete air-conditioning for total comfort important.

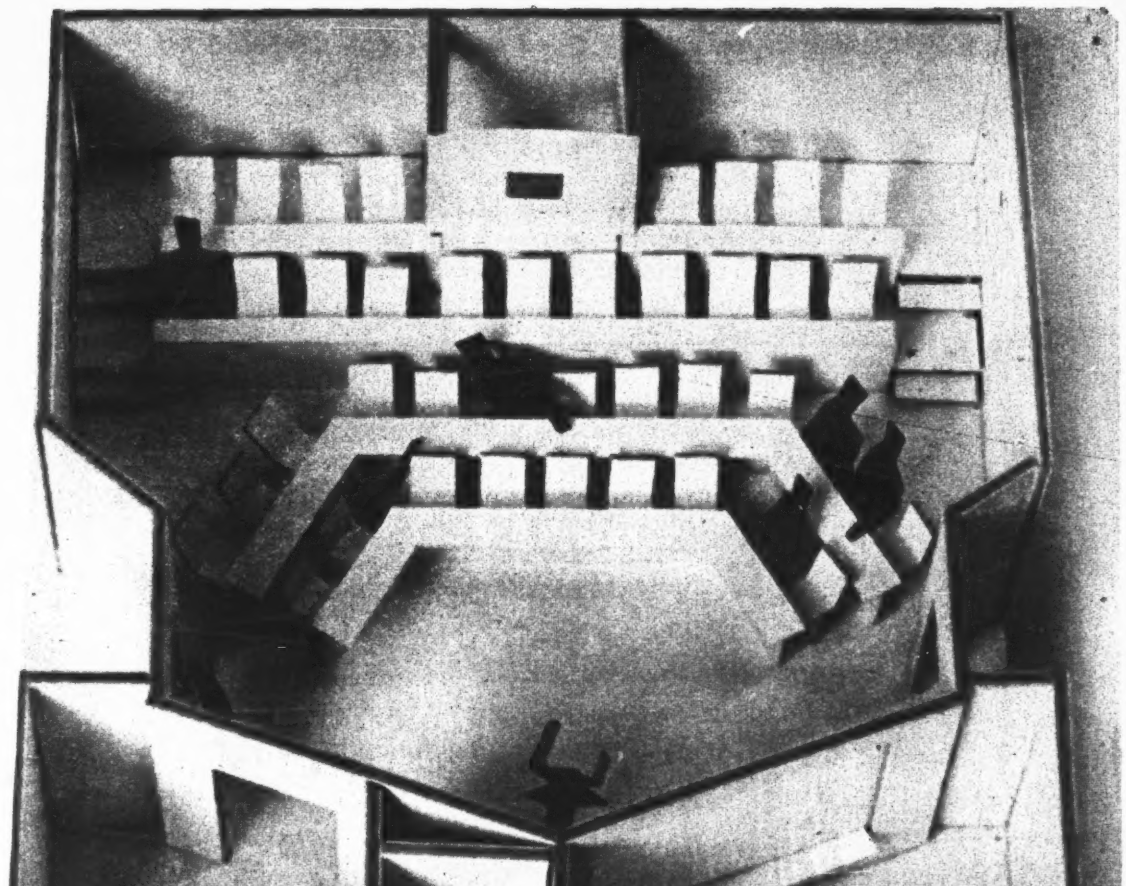

x-ray file
case records
light box
film and audio cartridges
brainos slide file
parts storage
microscopes
audio playback &
slide projector
movie viewers
slide viewers
film projector
microscope

media storage island *viewing equipment storage*

DETAIL OF STORAGE UNITS

S-4, S-5

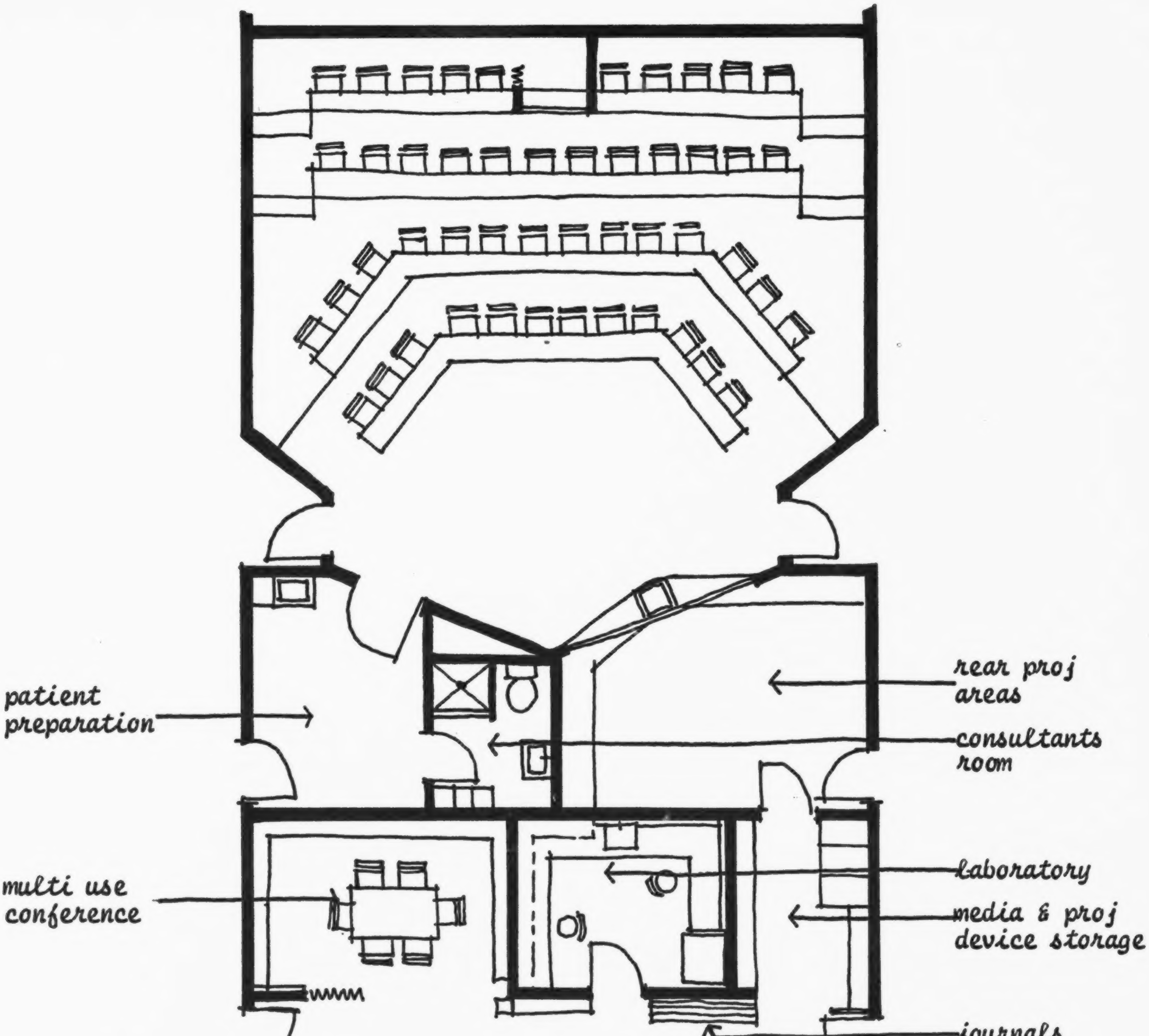
SERVICE-RELATED TEACHING SUITE



PHOTOGRAPH OF MODEL

S-4, S-5

SERVICE-RELATED TEACHING SUITE


patient preparation
rear proj areas
consultants room
laboratory
multi use conference
media & proj device storage
journals
carrels

PLAN OF COMBINED TEACHING ROOM AND RESOURCE SUB-CENTER

Surgical Service Facilities

Surgery needs an S-4 and an S-5

The surgical service is parallel to the medical service in typical distribution of beds, types of teaching programs, and educational facility needs. Therefore, in addition to the floor-related classroom located on each surgical nursing floor, and the educational facilities which will be included within each surgical nursing unit, the surgical service requires a teaching room (S-4) and a resource sub-center (S-5) The basic functions and planning data are the same as previously discussed, and again these facilities would form an educational center directly related to the offices and nursing beds of the surgical service.

Conference room related to the O.R.'s

Surgery also requires two facilities related to its operating rooms. One is a space in the operating suite where the surgeons can discuss cases and procedures before surgery with the residents and students who have "scrubbed-up" and who will assist and observe within the O.R. This "briefing room" will also be used for post-operative reviews and for similar sessions involving other operating room personnel — nurses, anesthetists, and technologists. Since no more than 10 or 12 persons will be involved, the appropriate facility will be the same type of conference room developed for the nursing units (see 4. following). One such conference room should be provided for every three or four operating rooms within the surgical suite.

Observation of surgery

The second special need for surgery is facilities for observation within the operating rooms. It appears to be generally accepted that for teaching surgical techniques, the student should scrub and go into the O.R.; no observation technique, neither physical nor electronic, can substitute for personal involvement. For general observation, and in order to teach general O.R. procedures and methods to medical students and other interested members of the health team, remote observation is quite satisfactory and the employment of television seems a better answer than observation galleries or windows. It is important to plan for a flexible TV distribution system with the opportunity for observation at a number of locations within the hospital.

Neuro-Psychiatric Service Facility

Up to 50% of the beds in NP Service

At one time the *VA* built some hospitals that were for neuro-psychiatric patients only, but since a large percentage of such patients also require medical and surgical care, the current philosophy is to build general purpose hospitals. In these replacement hospitals up to 50% of the beds may be in the N.P. service.

The same basic educational facilities provided for medicine and surgery should be provided also for the Neuro-Psychiatric Service. They include facilities within each nursing unit, the floor-related classroom (S-1 or S-2), the service-related teaching room (S-4), and the resource sub-center (S-5). Since the total beds in the N.P. service may be greater than either medicine or surgery, the capacities of the teaching room and the resource sub-center must be adjusted accordingly. Similarly, adjustments must be made for the fact that N.P. nursing units are smaller (30 beds instead of 40) than medical and surgical units. Reference to the two case studies presented later in 5. will show how these variations may be reflected in the capacity of each facility.

Same basic facilities with adjusted capacities

Neuro-psychiatry does require one further type of facility, and that is a suite of group therapy and interview rooms, each with observation potential. The Therapy Suite S-6, as described and illustrated on the following pages, could be located practically any place within the N.P. service, but ideally it would be part of the teaching room and resource sub-center complex.

Need for a therapy suite

The Therapy Suite is required for patient care since group therapy sessions are part of the regular care routine, regardless of the teaching mission. Educational programs will require that a means of observing therapy sessions and interviews be provided; a television system which allows observation, distribution, remote viewing, and recording is a logical solution. The Therapy Suite provides a central television origination core from where signals can be distributed for viewing in the N.P. service, in the hospital, or elsewhere in the medical center. A TV system for observation is diagrammed in Figure 5.

Planning for television observation

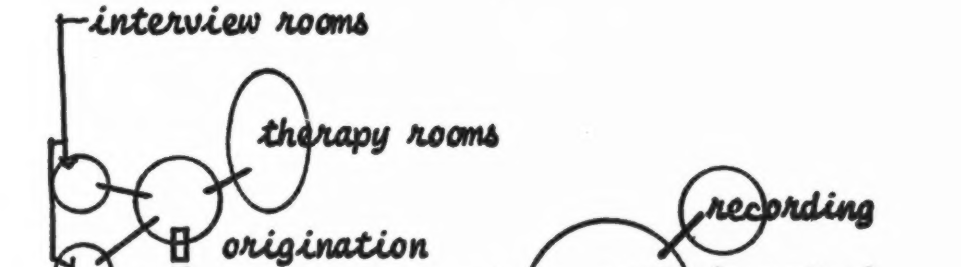
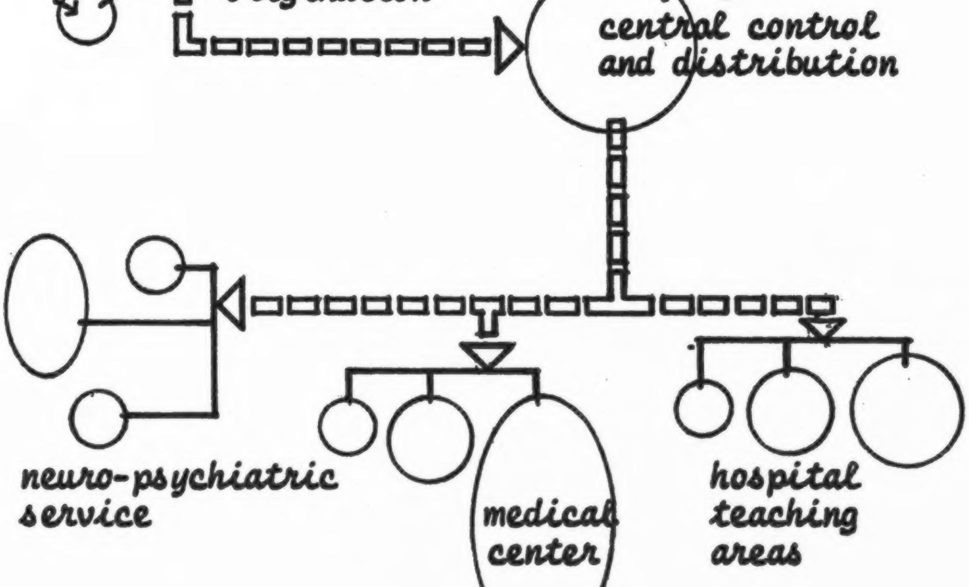
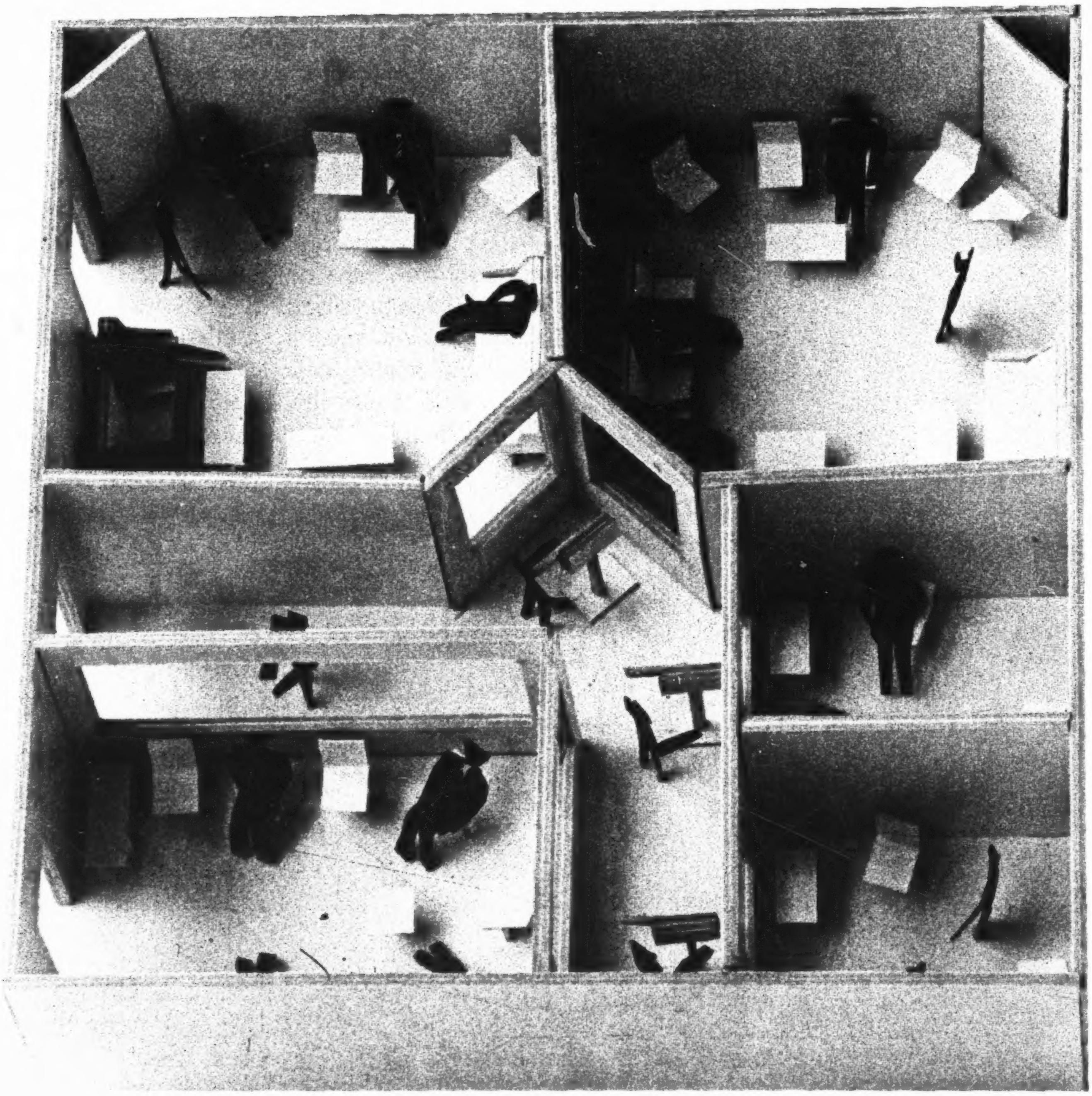



Figure 5. Diagram of a TV observation system for psychiatry.

S-6

THERAPY SUITE — PSYCHIATRY



PHOTOGRAPH OF MODEL A

S-6

THERAPY SUITE — PSYCHIATRY

PURPOSE:

Provide a suite of rooms for the psychiatric service with the appropriate environment for group therapy and interview-consultation, and which also becomes a teaching center by inclusion of TV observation facilities.

PRINCIPAL USES:

- group therapy sessions and psycho-drama
- family interview sessions
- interview and consultation with patient and one or two medical doctors or psychologists
- patient testing either in groups or privately
- care and therapy planning sessions involving patient, medical staff, and appropriate health science personnel
- TV observation for educational and training purposes with distribution to appropriate classrooms and conference rooms
- physical observation with small groups

USERS:

- groups of patients from all N.P. nursing units
- individual patients from all N.P. nursing units
- medical staff
- residents
- students and trainees
- health science personnel (particularly psychologists)
- observers — staff, students and trainees located in conference rooms and classrooms

QUANTITY:

One for the Neuro-Psychiatric Service

SPACE REQUIREMENTS:

- therapy rooms seating 8 to 12 persons in an informal arrangement encouraging interchange and free expression
- interview-consultation roms for a maximum of 4 persons
- television core area with cameras

(The number of therapy rooms and interview-consultation rooms, and therefore the size of the TV core, will depend on the size of the N.P. service, the emphasis on group therapy, and the extent of education and training programs.)

SIZE:

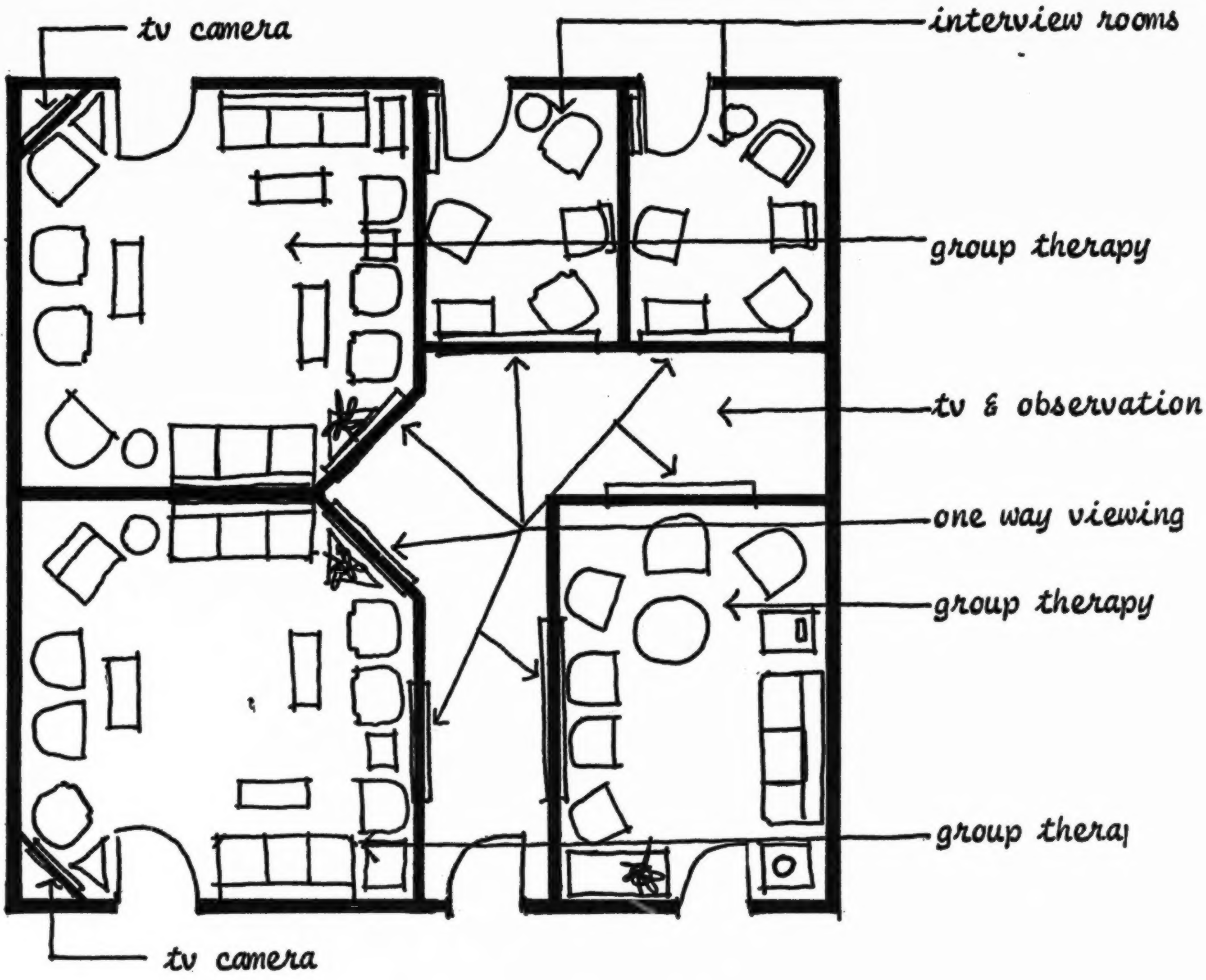
- group therapy room
  - — minimum recommended area for 12 persons 225 sq. ft.
- interview-consultation room
  - — minimum recommended area for a maximum of 4 persons— 80 sq. ft.
- Television core area — as required by number and arrangement of rooms.

LOCATION:

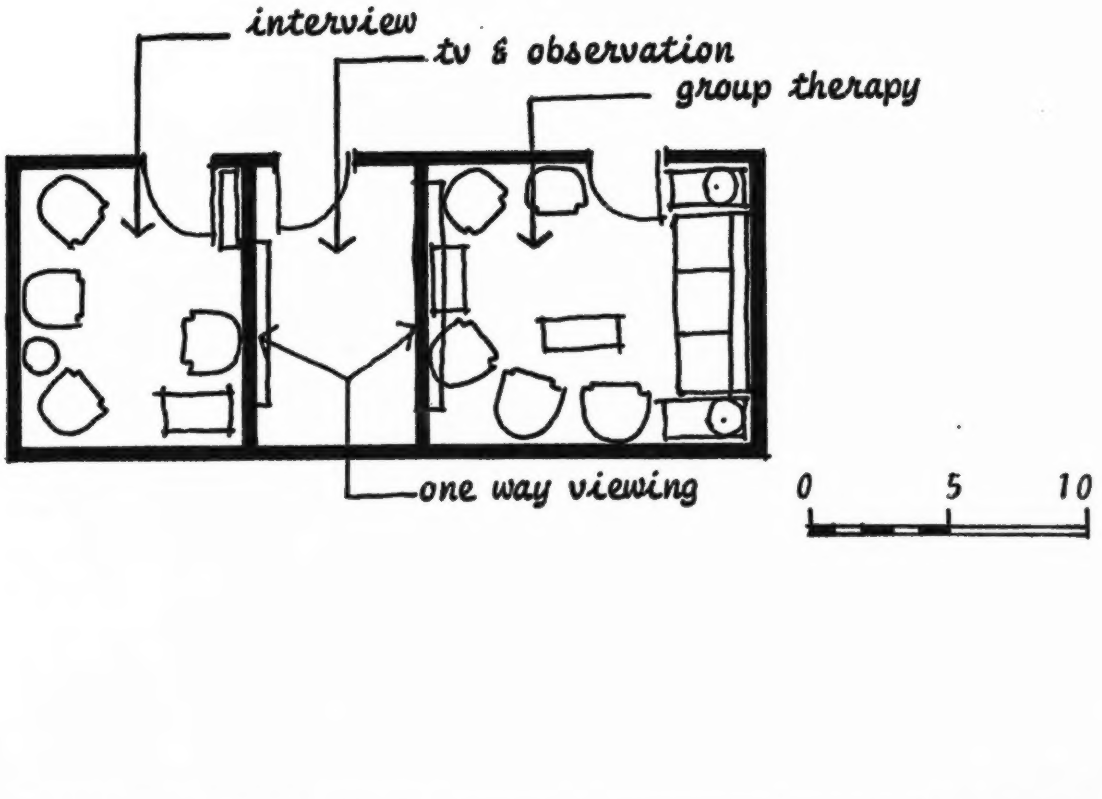
Within the N.P. service area, but outside any one nursing unit. Easily accessible and controlled from the N.P. nursing units.

S-6

THERAPY SUITE — PSYCHIATRY


tv camera
interview rooms
group therapy
tv & observation
one way viewing
group therapy
group thera
tv camera

PLAN A


interview
tv & observation
group therapy
one way viewing
0
5
10

PLAN B

S-6

THERAPY SUITE — PSYCHIATRY

FURNISHINGS AND EQUIPMENT:

Therapy rooms:
- lounge chairs, sofas, tables, and other informal furniture
- pictures, draperies, and non-institutional colors
- remotely controlled TV cameras for angles of observation unavailable from the television core area

Interview-Consultation rooms:
- small desk, desk chair, and several arm chairs

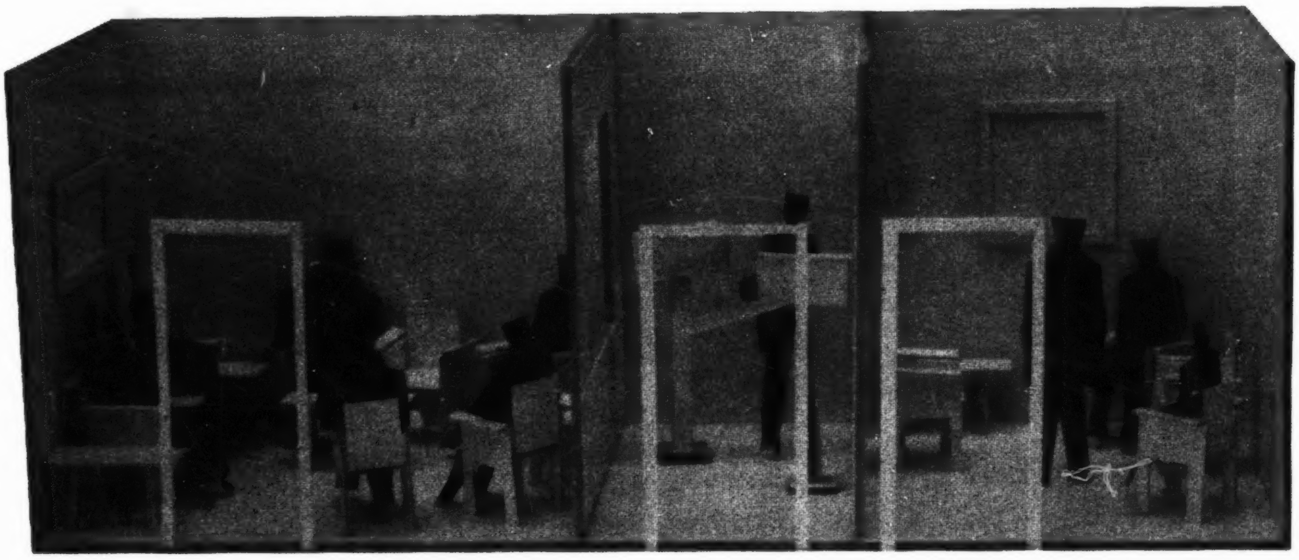
Television core:
- TV cameras
- control of remote cameras
- audio control system

LIGHTING:

All lighting dimmer-controlled with ranges of 10-60 footcandles available in each of the rooms

ACOUSTICS:

- audio pick-up in all therapy and interview-consultation rooms for monitoring, distribution, and recording
- acoustical isolation between rooms



PHOTOGRAPH OF MODEL B

Facilities for the Physical Medicine and Rehabilitation Service

PM&R may be assigned beds

In some *VA* hospitals, the PM&R Service is assigned beds, particularly for the educational value that PM&R residents and students receive by maintaining contact with day-by-day bed care and by seeing rehabilitation as part of a total care program. When beds are assigned to PM&R, the number rarely exceeds more than one nursing unit; in each such nursing unit the basic educational facilities discussed in the next section should be provided.

Activities and facilities for PM&R

The major activities of the PM&R Service occur in the therapy and rehabilitation section of the hospital. To this area up to 200 patients per day may come from all over the hospital for therapeutic and rehabilitative sessions ranging in duration from half an hour to half a day. The sessions include occupational, recreational, physical, corrective, manual arts, speech and hearing therapy, and a number of other specialized rehabilitative methods. To accommodate these programs, a variety of spaces including woodworking shops, craft shops, outdoor areas, gymnasia, controlled environment rooms, soundproof rooms, pool and tub rooms, and various recreational facilities are required. These facilities with their specialized equipment may total 20,000 square feet or more.

Many educational and training facilities

The various therapeutic and rehabilitative programs which are conducted within the PM&R Service offer important opportunities for education and training. In addition to residents and medical students, therapeutic specialists assigned to the PM&R Service receive training. The designation of educational facilities for these training programs is difficult to establish as the large majority of the training takes place as the patient is receiving therapy. Special "education only" facilities constitute only part of the total needs.

The following points summarize the educational needs within the PM&R Service:

Offices

- PM&R residents will require private or semi-private offices within the service and these will be similar to the offices provided in the nursing units.

Work-study carrels

- A work-study carrel for each medical student and trainee assigned to the service should be provided. These facilities will be provided as a work-study area similar to that described in the following section.

Nursing unit facilities

- If the PM&R Service has nursing beds assigned to it (and these will be in another part of the hospital) the offices and work-study area included in the nursing unit would be part of the total educational requirements for the service.

Conference room

- A conference room should be located within the service to accommodate small group, informal educational activities. Its capacity will vary with the type and extent of programs, but generally will range between 10 and 16 persons.

Classroom

- For those more formal instructional programs which require that groups of students, staff, residents, consultants, and trainees gather together, a health sciences classroom (S-1) should be directly accessible. It may be conveniently shared by one or two other services such as radiology or pathology, but it should be on the same floor and no more than a hundred or so feet away.

Lockers

- For trainees assigned to the PM&R Service, and who have no association with other parts of the hospital, lounge, locker and toilet facilities should be available.

Additional floor area required

As was stressed initially, all areas of the PM&R Service may be used for education and training. Therefore, in programming and planning the PM&R Service, consideration must be given to the needs of these programs in each of the areas. If training and education are to be conducted, upwards of ten per cent additional square footage will be needed in the therapeutic and rehabilitative areas themselves.

Relationships and special areas

Figure 6 indicates diagrammatically the types of facilities and relationships that generally occur in a PM&R Service. It also indicates major circulation between other units of the hospital and the location of the educational facilities. Figure 7 shows plans for two types of therapy area which indicate some of the specialized design considerations required by both the therapeutic functions and the training programs.

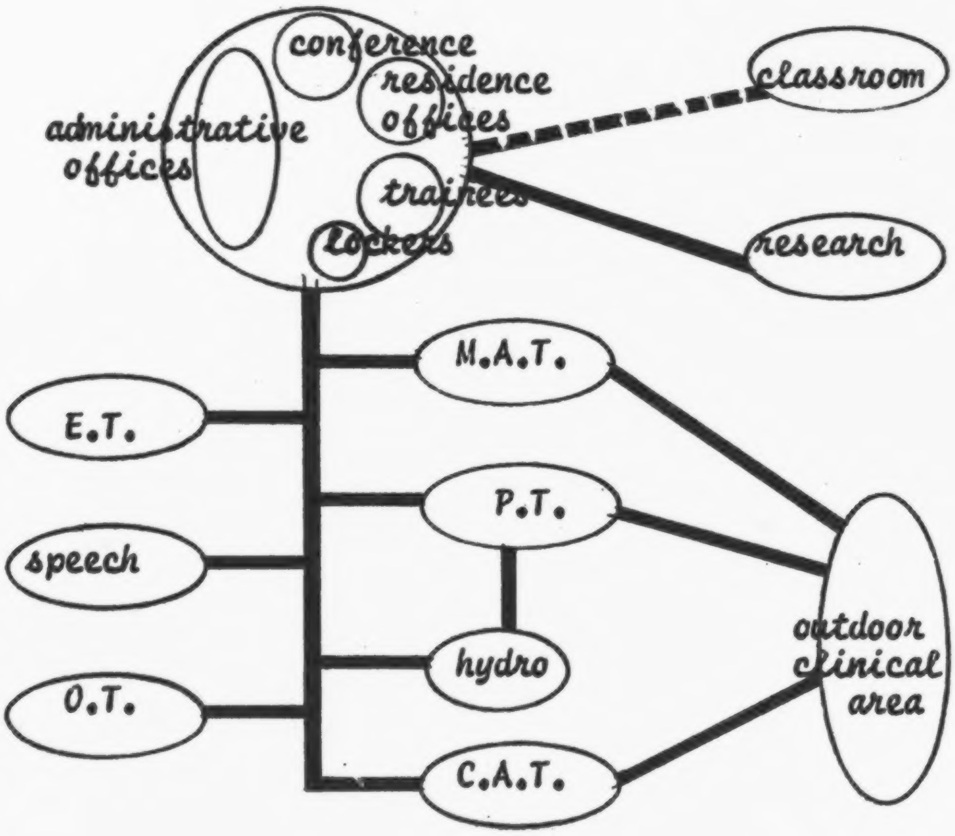
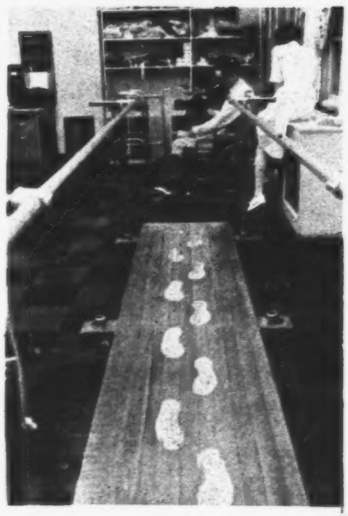
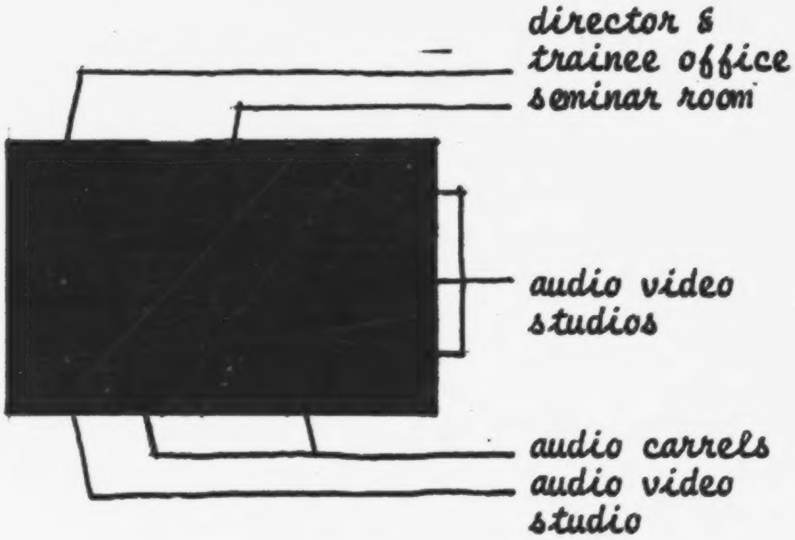
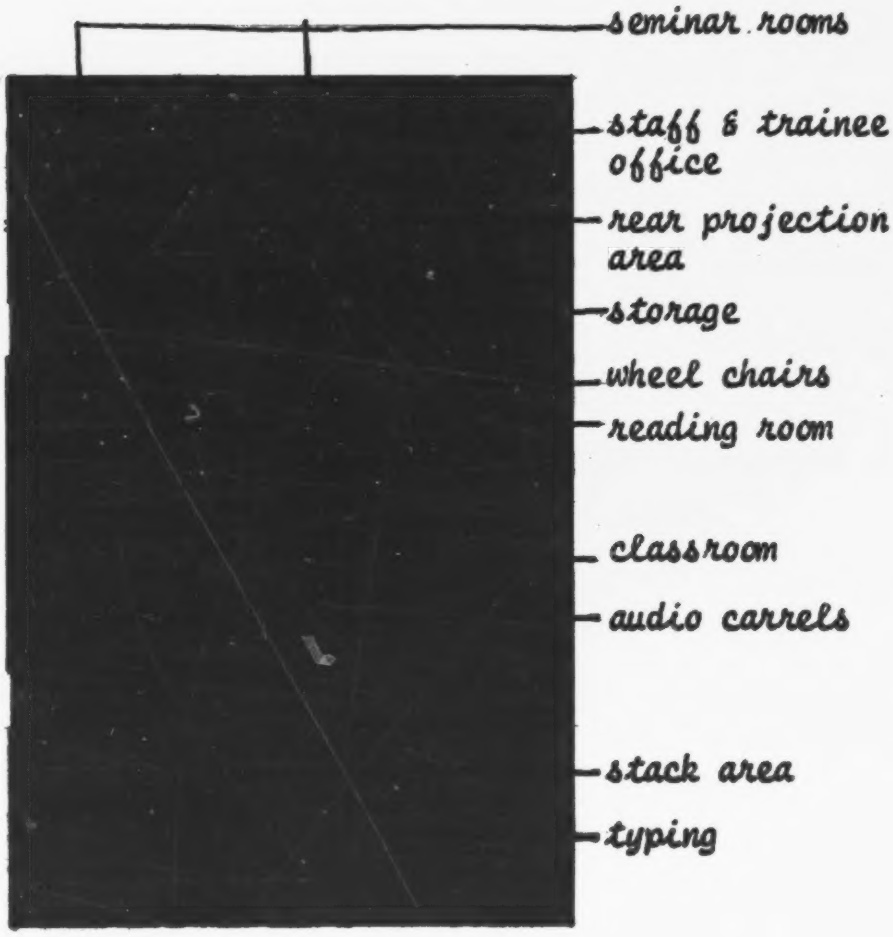


Figure 6. Diagram of the basic elements of the PM&R Service, including the suite of educational facilities, and showing how they are interrelated.




director &
trainee office
seminar room
audio video
studios
audio carrels
audio video
studio

speech therapy


seminar rooms
staff & trainee
office
rear projection
area
storage
wheel chairs
reading room
classroom
audio carrels
stack area
typing

educational therapy

Figure 7. Plans of two specialized therapeutic areas within the PM&R Service indicating how education and training are planned within patient treatment facilities.

Facilities for the Pathology Service

Day-by-day learning experiences

The Pathology Service offers opportunities for education and training programs involving residents, medical students, and technologists. The learning experiences are of two general types — clinical experiences involving basic laboratory procedures and anatomical experiences involving autopsies; these require personal involvement in the day-by-day functions of the Service. Therefore, laboratories and autopsy facilities must be sized to accommodate the additional personnel, but the magnitude of this increase in total area will be determined by the characteristics of a particular program.

Basic facilities

In addition, the following facilities should be provided specifically for education:

- Residents in pathology should be provided with semi-private offices similar to those provided in the nursing units.
- Student clerks and trainees should be provided with work-study carrel space. This space would be in addition to the regular laboratory and autopsy facilities which are required for practical experience, application of skills, and familiarization with techniques.
- For the informal educational programs which require that groups of pathologists, residents, students, and trainees gather together for discussion and interchange, a conference room (N-2) should be provided within the Service.
- The Pathology Service should have a classroom readily accessible, but which may be shared by other services such as medical records and radiology. However, the classroom should be on the same floor and no more than several hundred feet away from the Pathology Service.

Combine facilities as an educational suite

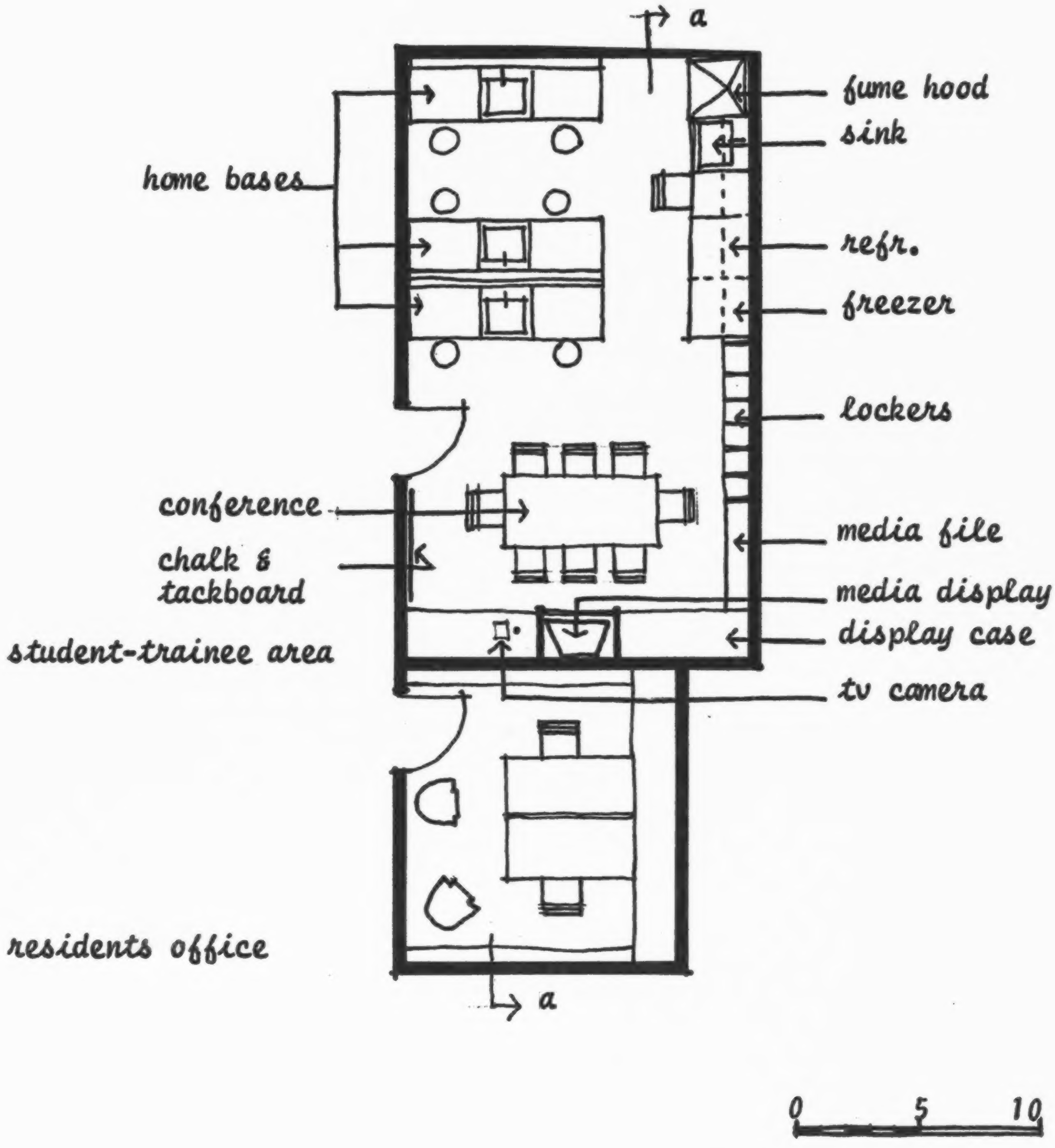
Rather than adopting the policy that the entire clinical laboratory area becomes a training and educational facility, the Pathology Service in a *VA* hospital may find it advantageous, depending on its philosophy of administration and education, to establish a student-trainee area combining work, study, application, and conference functions. This self-contained educational facility would be an integral part of the clinical laboratory facilities, but would specifically house education and training programs. Such a facility is defined and described as S-7 — An Educational Suite for Pathology.

Uses of TV in pathology

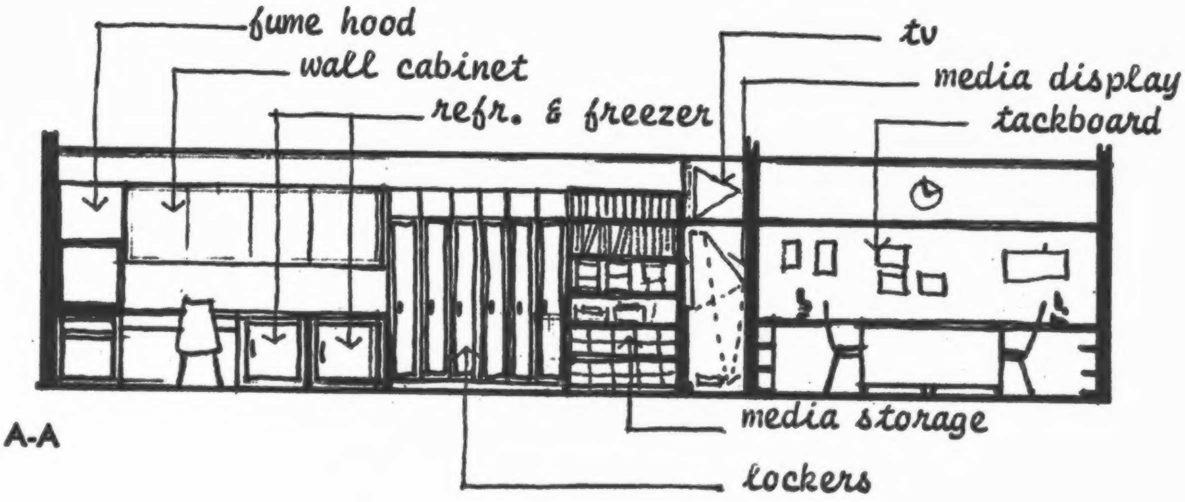
There are educational advantages inherent in students and trainees being able to observe autopsies. As with the observation of surgery, those persons who are to learn specific techniques should be physically present and should participate. This would involve a total group of no more than 6 to 8 persons and they can be accommodated in most well planned autopsy rooms. However, when larger groups wish to observe general practices and procedures, observation by television may be a satisfactory approach. A TV camera with a remotely controlled zoom lens could be located over the autopsy table and this, supplemented with a manually controlled camera, would give complete

S-7

EDUCATIONAL SUITE — PATHOLOGY


a
fume hood
sink
home bases
refr.
freezer
lockers
conference
media file
chalk & tackboard
media display
display case
student-trainee area
tv camera
residents office
a
0
5
10

PLAN


fume hood
wall cabinet
refr. & freezer
tv
media display
tackboard
media storage
lockers

SECTION A-A

S-7

EDUCATIONAL SUITE — PATHOLOGY

PURPOSE:

To create a self-contained facility specifically for educational functions that are an integral part of the Pathology Service.

PRINCIPAL USES:

- office, work, and study ("home-base") facilities for residents, students and trainees assigned to pathology.
- as a training laboratory for the acquisition and application of laboratory skills under the guidance of the pathology staff.
- for teaching functions — small conferences, seminars or lectures — involving demonstrations and use of projected instructional aids.
- for conferences and seminars involving the pathology staff, students, and trainees, and other students and trainees from around the hospital.
- informal interchange and learning (due to self-contained concept, can be available at all times)

USERS:

- pathology residents
- medical students assigned to the service
- laboratory technology trainees
- residents, students, and trainees from other areas of the hospital

QUANTITY:

One suite for the Pathology Service

SPACE REQUIREMENTS:

- accommodate a total of 6 to 12 persons involved in:
  - — individual work and study
  - — acquisition and application of laboratory skills
  - — conferences, seminars and other group learning
- components
  - — semi-private offices for residents
  - — student and trainee work-study area
  - — laboratory area
  - — conference-learning area

SIZE:

- semi-private offices — 60 sq. ft. per resident
- work-study and laboratory area
  - — minimum recommended area for 7 stations — 180 sq. ft.
- conference-learning area
  - — minimum recommended area for 12 persons — 180 sq. ft.

LOCATION:

As an integral part of the Pathology Service, yet with access that will allow it to be used independently.

coverage. The images may be distributed to any number of appropriate viewing rooms. For clinical pathological conferences the pathology classroom or one of the several other larger multi-discipline classrooms located throughout the hospital can be effectively used as long as television for magnification and the means of showing films and slides are available.

Facilities for the Radiology Service

Facilities to support education and training in the Radiology Service are quite similar in concept to those for pathology; residents, students, and radiology trainees will be involved. However, in addition, provision must be made for the residents and medical students who come to radiology from all over the hospital to review x-ray films and to seek the consultation and advice of the radiology staff.

Provision for education and training may be summarized as follows:

Offices, carrels and a conference room

- Residents in radiology should be provided with semi-private office facilities.
- Medical students and radiology trainees assigned to the department should be provided with work-study carrels; in both the offices and work-study area, additional x-ray film illuminators should be provided.
- A conference room should be provided for informal interchange and discussion among personnel of the Radiology Service and with clerks and residents from throughout the hospital.

Reading rooms

- Of particular importance is the provision of a series of "reading rooms" each accommodating 4 to 10 persons and used to display large numbers of x-ray films for review, discussion, and consultation.

Classroom

- A classroom facility similar to S-1 should be available for use by radiology when needed for intermittent, more formal instruction. This classroom can be shared by other departments, but should be on the same floor and readily accessible.

Walls of view boxes

Either within the Radiology Service, or very near to it, space should be provided which can accommodate extensive banks of x-ray illuminators for displaying current x-rays. Stretches of corridor space would be quite ideal. Not only is the display of such an extensive group of x-rays a good educational device, but it also allows the medical staff to drop in when convenient for them to review x-rays dealing with their particular patients.

Educational Suite S-8

An Educational Suite incorporating the basic facilities has been developed and is defined and described as S-8. This suite would be an integral part of the Radiology Service and would house a large percentage of its educational and training needs.

Facilities for Education in the Nursing Service

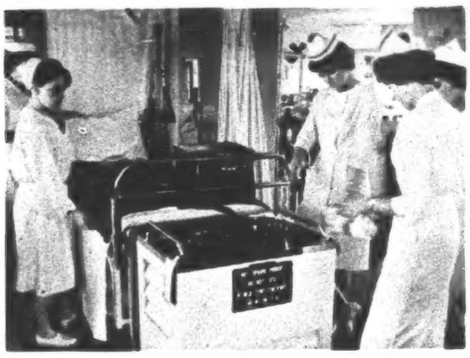
Types of programs in nursing

The nursing service in the *VA* hospital has two broad educational responsibilities — developing the talents and skills of *VA* nursing personnel as an in-service training program, and training nursing personnel as a community responsibility through affiliated schools of nursing. Three general types of personnel are involved; practical nurses and nurses aides usually are trained as an in-service function while registered nurses receive their *VA* hospital training through the affiliated programs. In addition, nurses who come into the *VA* hospital as full time personnel also require some training and up-dating experiences.

Facilities in the nursing unit

The nursing student and trainee's day-by-day practical experience with patients occurs quite logically in the nursing unit. Here are available the most useful and most practical experiences; the provision of work-study areas, conference facilities, and examination-treatment rooms within the nursing unit as discussed in the next section, enhance these experiences which are basic to the training of aides and practical nurses, as well as professional nurses.

Classrooms and teaching rooms



In addition, formal classroom instruction is conducted by the Nursing Service in a *VA* hospital and this is coordinated and directed by the Associate Chief for Nursing Education. Two types of educational facilities are required. One is a classroom facility used by a teacher working with a variety of instructional aids for instructing groups of nurses and trainees. Many times this will include the demonstration of special apparatus and equipment as well as common hospital equipment such as a patient's bed. Although the demands on classroom facilities imposed by the training programs of the Nursing Service are heavy, they can be met through the provision of the floor-related classroom (S-1) and the availability of service-related and hospital-wide teaching rooms (S-4 and H-1) on a scheduled basis. In fact, it is the extensive nursing programs requiring classroom facilities that help substantiate the need for multi-discipline classrooms and teaching rooms.

Demonstration room

The second type of required instructional facility is a nursing-demonstration room permanently equipped with 2 to 4 beds. Here the nursing students and trainees, working with mannequins, equipment, and apparatus, will learn the fundamental techniques and methods of patient bed care. This facility defined as S-9 will provide an area where persons may watch such demonstrations as well as participate.

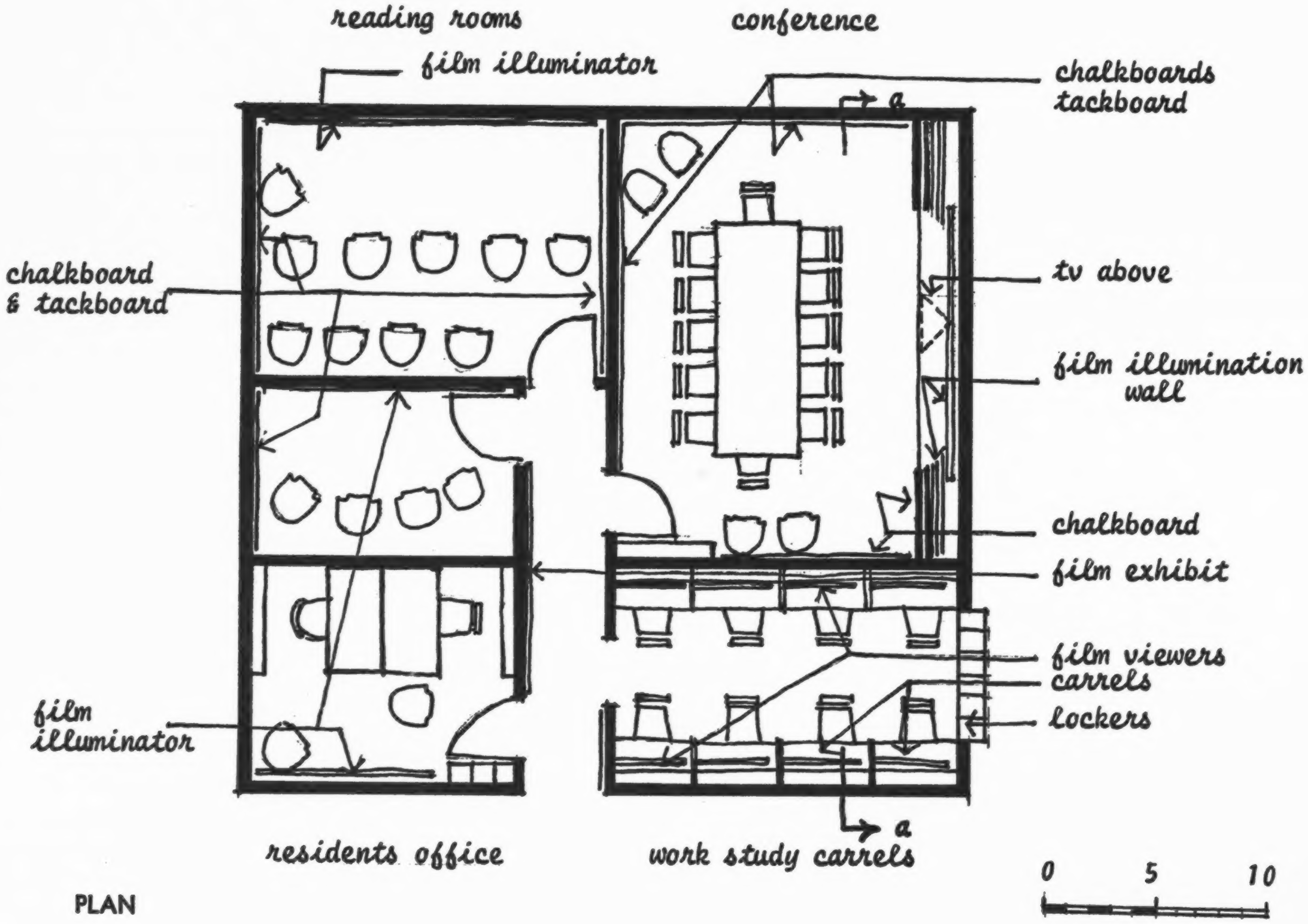
Conference room and chiefs' offices

The Associate Chief should be located near the chief nurse's office and a conference room which can be used for staff planning sessions, seminars, small conferences, and other informal administrative and training functions. Finally, lounge and toilet facilities for nursing students and trainees should be provided in the same area of the hospital where similar facilities are provided for the full time nursing staff.

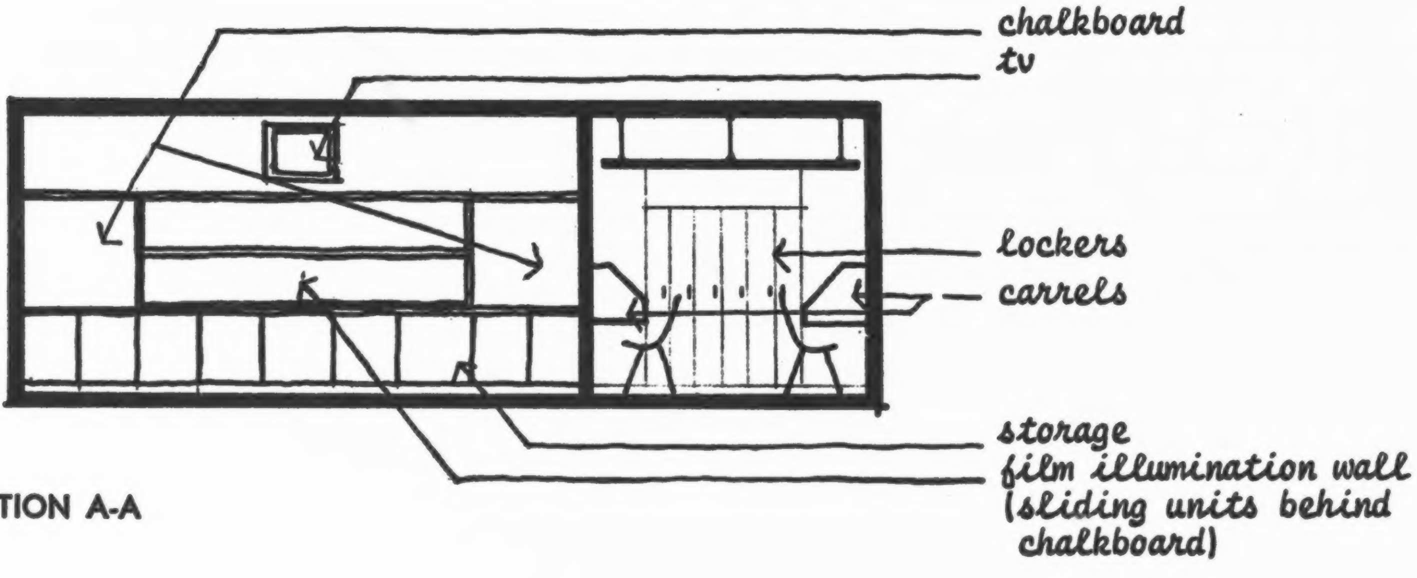
Even though the Nursing Service has relatively few educational facilities completely for its own use, the impact of its programs is felt when programming most educational facilities in the hospital.

S-8

EDUCATIONAL SUITE — RADIOLOGY


reading rooms
conference
film illuminator
chalkboards
tackboard
a
chalkboard
& tackboard
tv above
film illumination
wall
chalkboard
film exhibit
film viewers
carrels
lockers
film
illuminator
a
residents office
work study carrels
0
5
10

PLAN


chalkboard
tv
lockers
carrels
storage
film illumination wall
(sliding units behind
chalkboard)

SECTION A-A

S-8

EDUCATIONAL SUITE — RADIOLOGY

PURPOSE:

Creation of a suite of facilities to house the major learning functions of the Radiology Service.

PRINCIPAL USES:

- office facilities for residents which can be used for reading x-rays and dictating reports, as well as for small conferences.
- work-study ("home-base") facilities for students and trainees assigned to the service.
- for small groups and individuals to read and discuss x-rays and dictate reports.
- for consultation with the radiology staff
- for informal and "off-hour" learning
- conferences, seminars, and other small group learning involving interchange and exchange of opinions.

USERS:

- radiology residents and staff
- medical students
- radiology trainees
- residents and students from other areas of the hospital

QUANTITY:

One suite for the Radiology Service

SPACE REQUIREMENTS:

- accommodate a total of 15 to 30 persons involved in:
  - — independent work and study
  - — small group reading and discussion
  - — consultation
  - — conference and discussion
- components —
  - — semi-private offices for residents
  - — work-study area for students and trainees
  - — reading roms (capacities of 4, 6 and 10 persons)
  - — conference room

SIZE:

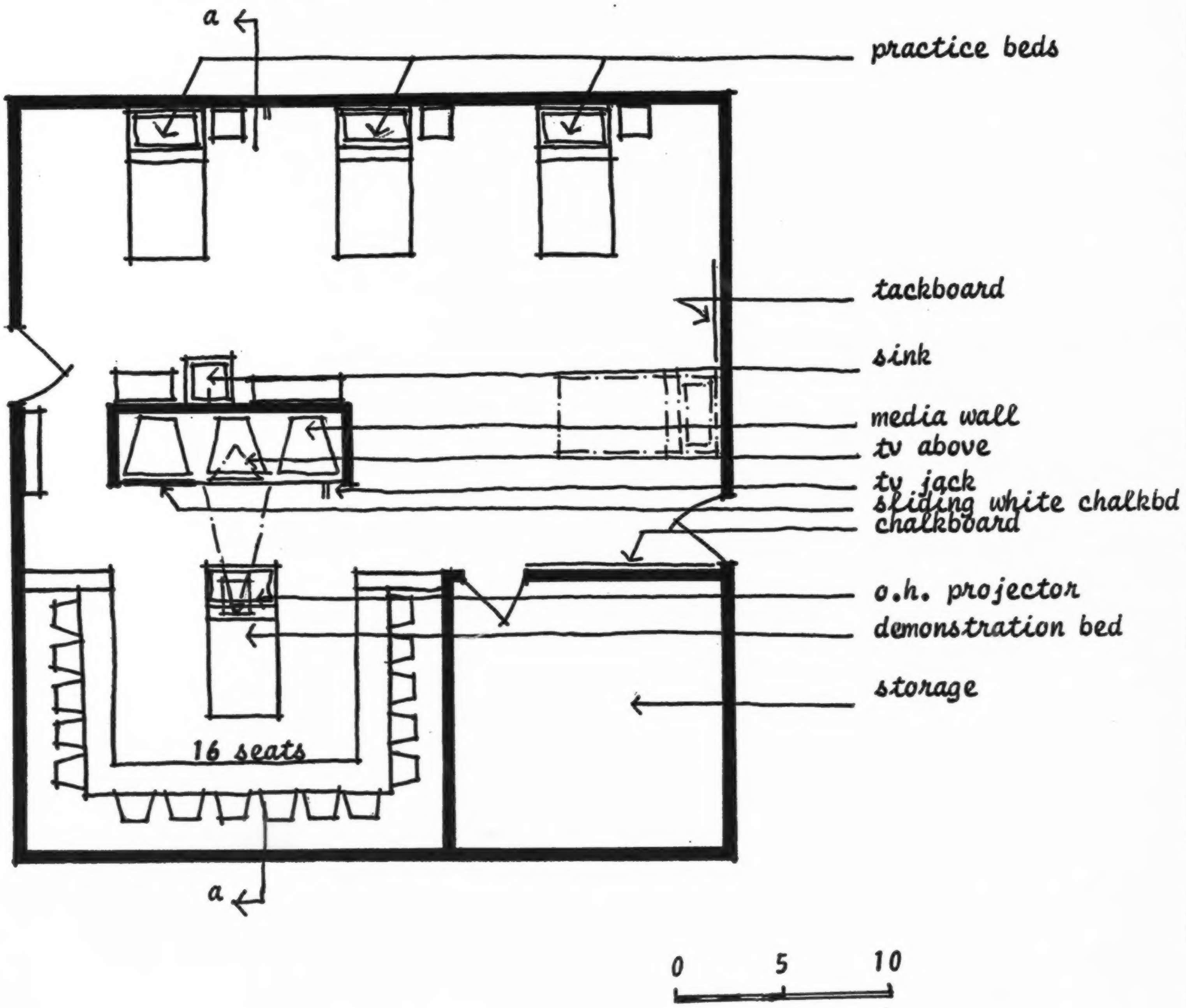
- semi-private offices — 60 sq. ft. per resident
- work-study area — 20 sq. ft. per trainee
- reading rooms —
  - — minimum area for 4 persons — 64 sq. ft.
  - — minimum area for 6 persons — 96 sq. ft.
  - — minimum area for 10 persons — 150 sq. ft.
- conference room —
  - — minimum recommended area for 12 persons — 270 sq. ft.

LOCATION:

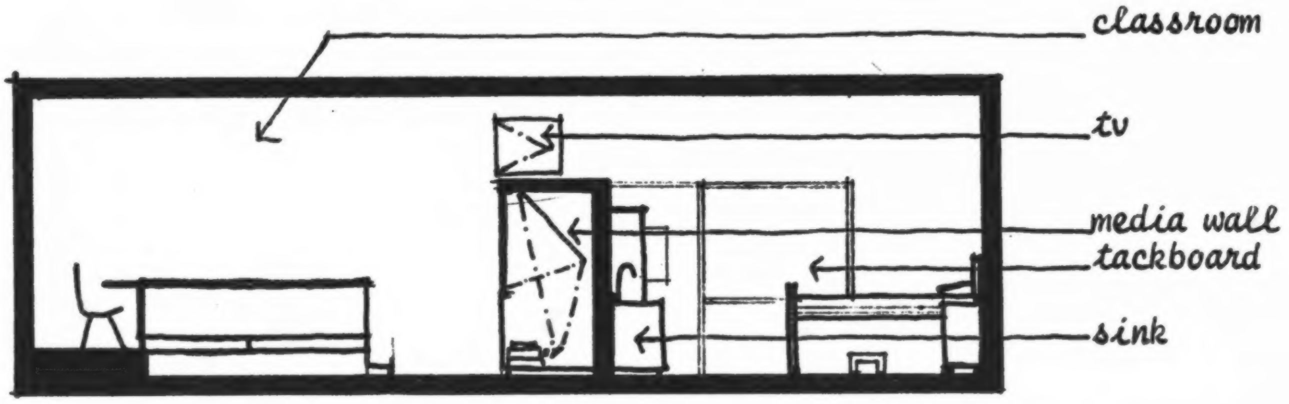
- as an integral part of the Radiology Service
- direct access from major circulation paths to other areas of the hospital
- planned so the suite may be available for use when the rest of the service is closed.

S-9

NURSING DEMONSTRATION ROOM


a
practice beds
tackboard
sink
media wall
tv above
tv jack
sliding white chalkbd
chalkboard
o.h. projector
demonstration bed
storage
16 seats
a
0
5
10

PLAN


classroom
tv
media wall
tackboard
sink

SECTION A-A

S-9

NURSING DEMONSTRATION ROOM

PURPOSE:	To provide a space in which nursing trainees may work with basic patient care equipment and may view demonstrations.
PRINCIPAL USES:	• demonstration of patient care procedures involving mannequins and hospital beds, stretchers, and other common hospital equipment. • practice in the application of skills (the above uses are for both in-service and affiliated training)
USERS:	• all nursing trainees — nurses aides, practical nurses, and student nurses • nursing staff
QUANTITY:	One for the Nursing Service
SPACE REQUIREMENTS:	• accommodate 2 to 4 hospital beds with space around each for auxiliary equipment and personnel. • provide room for 15 to 20 observers. • provide adjacent storage space.
SIZE:	• minimum recommended size for 2 beds — 800 sq. ft. • minimum recommended size for 4 beds — 1088 sq. ft.
LOCATION:	• within the nursing area adjacent to major circulation (on a medical service floor would be most desirable) • alternate — adjacent to the Associate Chief's office
FURNISHINGS AND EQUIPMENT:	• hospital beds • mannequins • availability of portable hospital room equipment — oxygen tents, intraveneous stands, electro-cardiograph machines, etc. (much of this equipment would be brought in from other locations) • chalkboards and tackboards • overhead projector and screen • television receiver and jack for origination • continuous counter tops with loose chairs
LIGHTING:	• overall illumination of 40 to 60 footcandles • supplementary lighting (dimmer-controlled) in demonstration area.

Dietetic Service Facilities

In-service and affiliated programs

Training conducted by the Dietetic Service is of two types — in-service training for *VA* personnel, and dietetic intern and residency programs through affiliations. The in-service programs occur in most *VA* hospitals and involve 20 or so persons at each training session. The intern and residency programs presently occur in about a dozen *VA* hospitals and involve about 20 interns and a handful of residents each.

Classrooms and conference rooms

When formal classwork is involved, the classrooms on the nursing floors are available on a scheduled basis. In addition, the work-study areas and conference rooms provided in the nursing units may be used by dietetic trainees and small groups of dietitians for educational purposes. In addition, it would be appropriate to provide a conference room seating from 10 to 14 persons adjacent to the office of the service chief.

Patient training

The Dietetic Service also conducts training and educational programs for patients and families as part of their rehabilitation. These can also be conducted in the classrooms and conference rooms on the floors and in the nursing units. In addition, all training requires the services of the Educational Support Center for the making of instructional aids such as slides, transparencies, photographs, models, charts, and diagrams. For individual training and for study and reference, these materials will be made available in the hospital Resources Center.

Educational Facilities in the Dental Service

An operating room and an office

The Dental Service in a *VA* hospital functions as a clinical service for patient care and treatment, and may have educational programs. Currently, over 40 *VA* hospitals are affiliated with dental schools and provide training opportunities for about 120 residents and interns. When the *VA* hospital is affiliated with a dental school as part of its total educational mission, then facilities should be provided for these additional personnel. Generally, each trainee should be provided with an operating room and an adjacent small office of 70 square feet, since the large majority of training experiences afforded the residents and trainees comes through day-by-day dental care of the *VA* hospital patients.

Other kinds of facilities

A conference room should be available for staff meetings, conferences, and informal teaching situations. Also, the dental service will sponsor meetings of local societies, colloquia, conferences, and continuing education programs which will be housed in the various classrooms, teaching rooms and auditoria located throughout the *VA* hospital. Lounge facilities with lockers should be available for the convenience of consultants who come to the hospital to participate in the training program.

Psychology Service Facilities

Trainees related to nursing units

Psychology trainees are dispersed throughout the *VA* teaching hospital and are directly associated with the individual nursing units. Generally, one psychology trainee is asigned for each 30 psychiatric beds and about one trainee for each 200 medical and surgical beds. Provisions for these trainees within the nursing units are defined in the following section.

Group testing

In addition, the Psychology Service requires facilities for group testing. Since these are small groups of 5 to 10 persons, the conference rooms in the nursing units or the classrooms on each floor would be appropriate for such purposes. Also, the Neuro-Psychiatric Service, where the large percentage of psychology trainees are assigned, has group therapy facilities and interview-consultation rooms which may serve for testing purposes.

Department of Medical Records

Cubicles for research

Normally the medical records department does not carry on formal training programs, although the possibility of trainees in medical records in the near future is quite reasonable. However, other than a work-study carrel for each of these trainees, no other special facilities will be required.

It has been previously suggested that the Department of Medical Records should be directly related to the hospital Resources Center to facilitate the use of medical records as instructional resources and teaching aids. In addition, within the Department, several small cubicles should be provided where staff and students may review series of records in detail as part of a research assignment or special investigation. Eventually, medical record departments must be prepared to move in the direction of electronic data processing in order to introduce savings in space and personnel time and to make records more readily accessible for use within the hospital and throughout the entire *VA* system.

Social Work Service Facilities

Centralized or decentralized facilities

Social work trainees come into the *VA* hospital for practical experience in dealing with patients and family needs. Conference and work-study facilities which may be used by social work trainees will be provided in the nursing units. Some educational facilities may be provided in the vicinity of the chief's office if the philosophy of administration and training is one calling for a centralized operation. A conference room, as a part of these service-oriented facilities, would be appropriate.

Facilities for the Personnel Service

Varying group sizes

The Personnel Service within a *VA* hospital conducts in-house training programs for the hospital staff and full time personnel. These training programs include courses in such diverse subjects as medical terminology, position classification, orientation for new personnel, essentials of supervision, and effective two-way communication. Obviously, a variety of different size groups is involved; the classroom, teaching room, and conference room facilities provided on the nursing floors and in the nursing units will meet the basic needs of these in-service training programs. In addition, the large auditorium or the hospital-wide teaching room will be required when very large groups are involved.

Use of Support and Resources Centers

The Personnel Service makes extensive use of the services of the Educational Support Center for the production and development of instructional aids. In addition, the Personnel Service will make materials and course outlines available in the Resources Center for individual study and progress. The Personnel Service often has a training specialist attached to it, and this individual should be able to extend helpful assistance and encouragement to many of the persons throughout the *VA* hospital who are engaged in teaching and training programs.

Educational Facilities in the Out Patient Department

Importance of the ambulant patient

The expanded role the ambulant patient is playing in medical education is certainly significant in planning a teaching hospital. As medical education becomes more concerned with comprehensive care and preventive medicine, and as the beds of the typical teaching hospital are used more and more for only critically ill and highly dramatic cases, the out patient department gains emphasis as an important teaching area. Here the student and trainee sees a more typical range of patients and here the conditions and relationships of private office practice are simulated. The educational importance of the out patient department was emphasized in the Invitational Seminar (Appendix B) and other current information dealing with medical education further reinforces this viewpoint.

Limitations in use of VA out-patients for teaching

At the present time, *VA* admission policies significantly limit the availability of ambulant patients for teaching purposes. Essentially, to be eligible for treatment in an out patient department, the visit must concern a service-connected disability. In addition, however, patients who have previously been admitted as in-patients may return to the out patient department for periodic examination and treatment after they have been discharged, and conversely, a patient who is to be admitted as an in-patient may first come to the out patient department for tests, histories, and examinations. These two programs, completion of bed occupancy (CBOC) and prior bed care (PBC), do extend the potential of the *VA* out-patient department for teaching. Because of the effect of these policies on numbers of visits and the inherent limitations in *VA* patients by virtue of sex and age, the utilization of ambulant patients in *VA* hospitals will probably remain an adjunct to the ambulant teaching programs provided in the medical school and other community hospitals.

Clinical modules for multi-discipline use

Nevertheless, certain planning considerations and appropriate educational facilities should be considered in rendering the *VA* out-patient department an effective and efficient teaching area. A first concern should be the development of examination and treatment modules which are multi-use in concept and which would permit high rates of utilization. Each module would contain a small, decentralized waiting area for 10 to 14 persons, 6 to 8 examination and treatment rooms, a nursing station, and a small conference-seminar room where doctors,

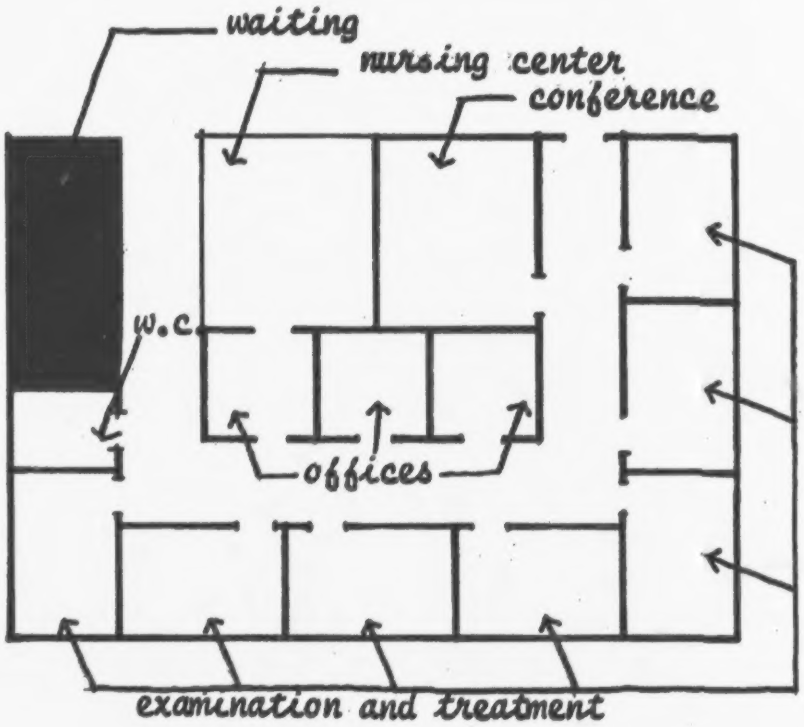


Figure 8. Plan of a clinical module which is multi-discipline in concept and contains waiting area, examination-treatment rooms, nursing station and conference room.

students, and trainees would gather informally to discuss cases and to talk further with individual patients. The needs of specialized clinics would be provided by mobile supply carts brought in from a central supply and storage area during the hours the clinic is in session. Some specialized clinics could not be housed in such a multi-discipline facility, but they are few in number. The concept for such a clinical module is expressed graphically by Figure 8.

Add modules as needed

The conference-seminar room included in the module would be similar to that provided as facility N-2 in the nursing units. The number of these clinical modules provided in any one out patient department would, of course, depend on the anticipated patient load. It should be emphasized, however, that one of the great advantages of the clinical module concept is that additional modules may be created when the patient load increases within a single *VA* hospital.

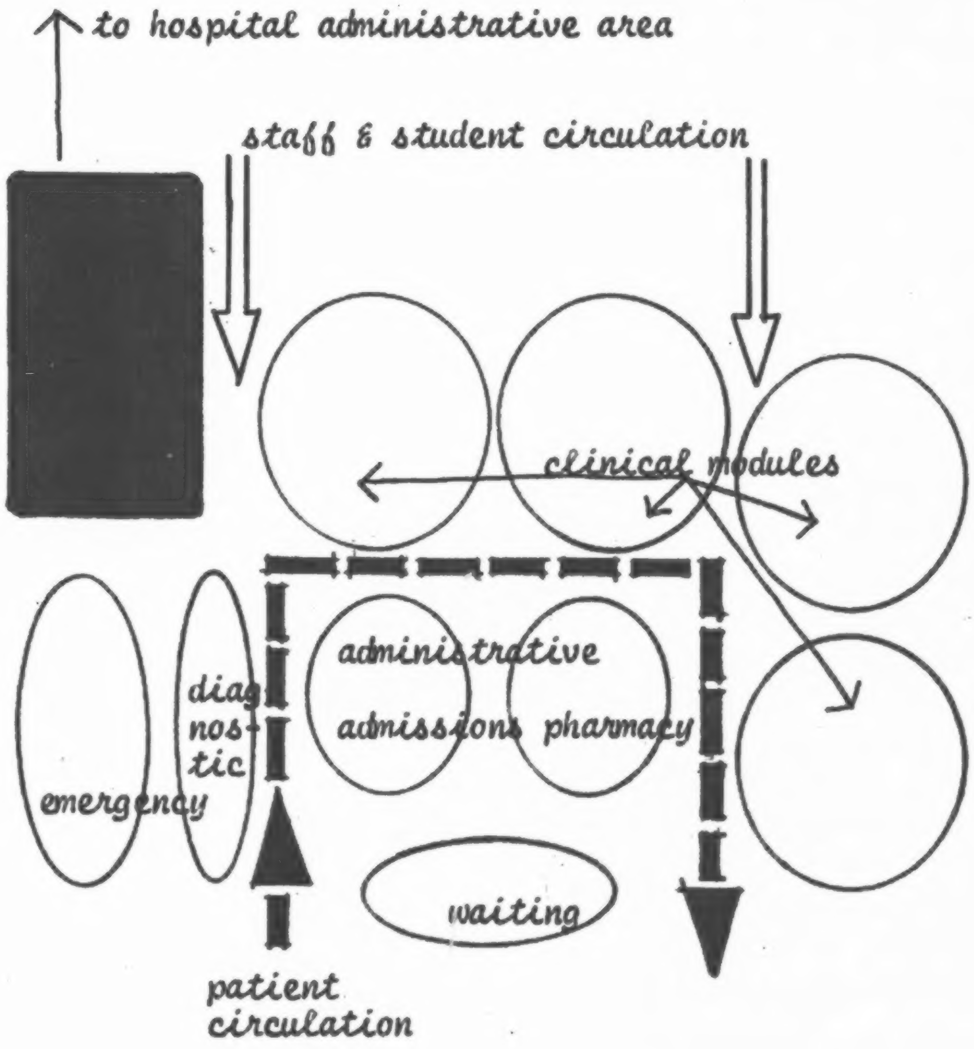

to hospital administrative area
staff & student circulation
educational core
clinical modules
administrative
admissions
pharmacy
diagnostic
emergency
waiting
patient circulation

Figure 9. Diagrams expressing the relationship of elements in the OPD, significant circulation paths, and relationship to other elements in the hospital.

Certain planning philosophies important

Certain basic planning philosophies should be represented in the arrangement of the clinical modules and other OPD elements such as admitting area, appointment area, and pharmacy, and in the relationship of the OPD to diagnostic and treatment facilities located elsewhere in the hospital. Several of these planning philosophies are represented diagrammatically in Figure 9. It should also be noted that a core of educational facilities would be provided to serve the total department. Included is a classroom similar to S-1 which is used for large gatherings of the students, trainees, and staff assigned at any one particular time to the OPD. Adjacent to this is a small lounge and toilet area for persons, including staff and consultants, coming to the OPD from other places in the hospital or the medical center. The third element is a series of work and study carrels which are available for charting, dictating, study, and other individual activities.

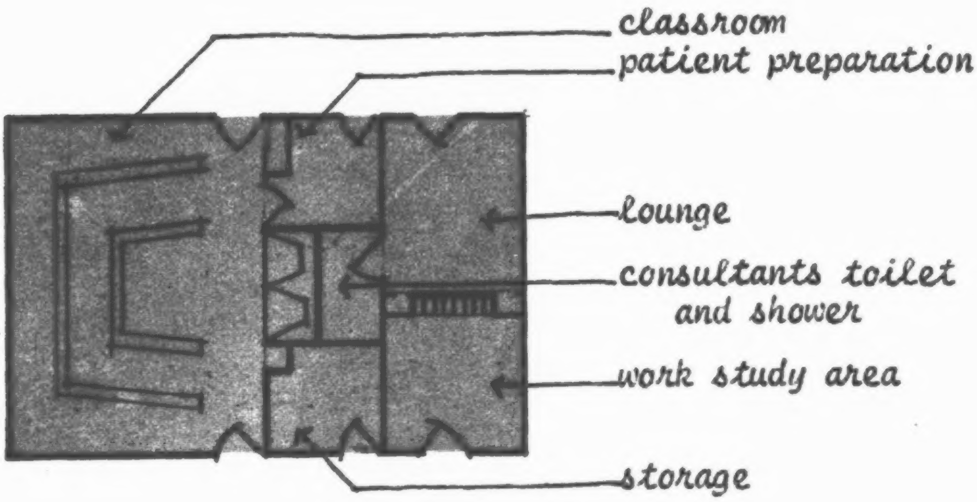


Figure 10. Plan of an educational core for the OPD which includes a classroom, lounge, and work-study area with adjunct spaces.

An educational core

An overall plan of this type of educational core is shown in Figure 10; it should be noted that these facilities are located at the edge of the out-patient department so that they may be shared by other departments in the administrative area of the hospital.

4. FACILITIES IN THE NURSING UNIT

Introduction

Locale for intimate and comprehensive learning experiences

In any hospital the nursing unit is the basic organization for patient care. Here the patient lives during his hospital stay and here are centered the persons, services, supplies and facilities which provide for his rest, his nutrition, his medication, his treatment, his cleanliness, his recreation, and his recovery. And because the day-by-day conduct of the patient's care and cure is centered in the nursing unit, it becomes the locale for the most intimate and comprehensive learning experiences for those persons who are being trained to assume the many responsibilities implicit in medical management.

Appropriate facilities for reinforcing learning experiences

Facilities are needed within the nursing unit of a *VA* hospital to promote, reinforce and dignify the learning experiences which take place there. It is the intent of this section, first to review the organization of the nursing unit and the people who work within it, next to consider the various learning experiences and the environment in which these activities should take place, and finally to define and describe in detail the types of facilities which will serve these needs.

Organization of the Nursing Unit

Nursing units defined by service responsibility

Three types of nursing units account for the majority of beds in a *VA* hospital and they are identified by service responsibility — medical, surgical and neuro-psychiatric. Sometimes neurological and PM&R units are considered separately, but there are rarely more than one or two such units in an entire hospital and they are not unique in character. Special care facilities such as intensive care, renal dialysis, and metabolic units, are provided in new construction, but because of their unique characteristics they are not included among those considered appropriate for general educational purposes.

40-bed units for medicine and surgery

Medical and surgical nursing units are similar in organization; in the newer *VA* hospitals each unit contains about 40 beds. From an operational, care, and service viewpoint, this is considered a desirable size and the facilities described later are based on the 40-bed medical and surgical nursing unit. Most existing *VA* hospitals have larger nursing units; some have as many as 50 to 60 beds per unit. When planning the remodelling of existing *VA* hospitals to incorporate educational facilities, the capacity of the educational facilities on the nursing unit must be proportionately increased to accommodate the additional residents, students, trainees and staff found in the larger nursing units.

Distribution of patient room types

In the newer *VA* hospitals, approximately ⅕th of the medical and surgical beds are in single rooms, ⅕th in semi-private rooms, and ⅗th in four- or six-bed rooms. The older hospitals, however, tend to have a higher percentage of beds in multiple-bed rooms and fewer in single and semi-private rooms, and the multiple bedrooms are larger; the 16-bed ward is common. Consequently, when considering educational facilities in existing hospitals, more examination-treatment rooms will be needed to provide for procedures which do not lend themselves to multiple-bed rooms, but which can be performed in private and semi-private rooms. The reasons for this are discussed in Appendix C — "Bedside Teaching — An Overview".

Other facility types

In addition to the bedrooms and their bath and toilet facilities, each nursing unit usually contains a nursing station, nurse office, and medication room; clean and soiled utility, linen and supply rooms; wheelchair and litter storage; kitchen or food handling facilities; housekeeping closet, examining and treatment room, and a patient's day room. To this listing should be added, of course, those facilities later identified as necessary to support teaching.

30-bed psychiatric units

Psychiatric nursing units tend to be smaller — 30 beds in new construction — and have fewer large multiple-bed rooms. The support and service facilities, however, are similar to those listed for medical and surgical units.

Nursing Unit Personnel

Personnel play dual roles

The day-by-day care of the patients in the nursing unit is conducted by the professional nurses who, in turn, coordinate the work of the aides and orderlies. Medical responsibility lies in the hands of the full-time staff physicians and the various therapeutic, rehabilitative and specialized care functions are conducted by health personnel — dietitians, social workers, psychologists and therapists. In addition, some personnel play dual roles in the nursing unit. Although they are at various stages in the acquisition of skills, knowledge and experience in preparation for assuming their full responsibilities for medical care, they contribute significantly, while training and learning, to patient care and welfare.

In a medical or surgical nursing unit the types and number of personnel participating in educational and training experiences vary somewhat, depending on the extent and character of the program. In general, though, they may be summarized as follows:

- residents — from 2 to 4 per 40-bed unit, assigned as part of a residency program. An individual resident is usually assigned to a given unit for from 4 to 12 months.
- medical students (clerks) — from 2 to 6 third- or fourth-year students assigned to the unit for periods of 4 to 6 weeks as part of their medical or surgical clerkship. Some of their time will be spent elsewhere in scheduled classes and conferences.
- other medical students — small groups of first- and second-year students may be assigned for three- to six-month periods as introductory clinical experiences such as physical diagnosis. One or two students may spend a term on the unit conducting a special study as part of an elective program.
- nursing students — 1 to 3 nursing students (certified degree students) may be assigned for three to six month periods as part of their practical experience.
- practical nurses and nurse aides — several may be brought onto the unit for relatively short periods of time to gain practical experience in patient care.
- dietitians — 1 or 2 dietetic trainees may gain experience in dealing with varying nutritional needs by assignment to the unit for short periods.
- social workers — at any one time, 1 or 2 special trainees may be gaining experience by interviewing and working with patients on the unit.

Types of learners

In psychiatric nursing units the same types of personnel will be involved, although there will be few first- and second-year students. In addition, there will be:

- psychologists — usually 2 psychology trainees will be assigned to each psychiatric unit for periods of 6 months to a year or two.

Other personnel must be accommodated

Many other personnel are involved in educational programs throughout the hospital — residents in radiology, pathology, and PM&R; and trainees such as laboratory and X-ray technicians, and physical, occupational, and speech therapists. These people are related primarily to service or departmental areas, rather than nursing units, and facilities for their programs have been covered previously in this Part II. On occasion, however, these will participate in conferences, interviews, rounds and seminars on the nursing unit, and the educational facilities on the nursing unit must be sized accordingly.

Educational Activities Within the Nursing Unit

Formal and informal learning

Every aspect of patient care in the nursing unit affords a learning experience. In addition, special educational activities are organized and conducted to concentrate on particular areas of competency and to make the communication of information and the acquiring of skills more efficient. A review of these experiences and activities will indicate the types of facility needed.

Educational activities of the resident

Residents, as qualified graduate physicians, assume the greatest responsibility for the day-by-day care of the patients, under the general direction of the medical staff. They are involved in taking histories, conducting physical examinations, issuing orders, prescribing medications, reviewing charts and records, studying laboratory results and X-rays, carrying out routine treatment procedures, ordering or conducting special diagnostic tests, conducting special examinations and therapeutic tests, and conferring with and coordinating other members of the health team. They may also conduct investigative studies of a patient or group of patients, review current writings in the field, and become involved in the training of the medical students assigned to the nursing unit. To conduct these activities successfully, the resident needs readily accessible space where he may examine, treat, and interview patients, plan with others responsible for patient care, meet with students and trainees, and where he may work and study effectively by himself.

The resident in psychiatry does all these things also, but a far larger percentage of his time is spent in interviewing and counseling individual patients and conducting group therapy sessions. Private space for interviewing and counseling is essential.

Activities of the medical student

Medical student clerks and other students may deal directly with patients under the supervision of the residents and medical staff. They are not prepared or legally permitted to assume responsibility in patient care. They undertake special studies, write up cases which involve history-making, physical examination, testing and analysis of findings; and work with the resident as he performs his duties. The student's work is reviewed and criticized periodically by staff physicians and consultants. He may also be given assignments in clinical subjects that must be studied and prepared. The student needs space to examine and interview patients, to meet with his peers and supervisors, and to work and study.

Needs of the staff physician

Staff physicians have the final responsibility for patient care throughout the service and work daily with the residents and students on the nursing unit. Besides caring for patients, they supervise, conduct, and review educational experiences, together with consultants brought in for particular cases. The staff physicians require facilities in each nursing unit for patient examination, treatment and interview, as well as for conference and discussion. These are in addition to private office facilities provided by the service.

Nursing education

Nursing students receive practical experience in bed care, care of ambulant patients, administration of medication, special nursing procedures, and observation of conditions and reactions of patients. They also record and chart, supervise ward personnel, carry out physicians' orders, and learn floor administration. Their work is reviewed and instructional material is presented by members of the nursing staff and special nursing instructors. Nursing students need places in the nursing units to work and study and to meet together for instruction and discussion; also, facilities such as the nursing station and the medication room should be enlarged to accommodate the training of student nurses.

The nursing aides receive periodic practical training in both bed care and care of ambulant patients. They too need a place where they can meet with their teachers on the nursing unit.

Providing for working rounds . . .

Groups of students, residents and staff meet each day to review patient progress. These "working rounds" usually involve a small group of six to eight persons moving from bed to bed, with conferences and discussions before and after visiting the patients. These conferences and discussions should be private, away from the patients and in a room where appropriate materials — X-rays, photographs, charts, and slides — can be displayed. Often working rounds will require the movement of a patient into an examination-treatment room in the nursing unit for conducting and observing examination and treatment procedures and methods.

. . . and informal, small groups

Small groups, made up of a resident or two, several students and a staff physician will meet frequently during the day to talk over cases; to review charts, orders and test results; and to discuss diagnostic, treatment, and other care procedures. A room which is readily accessible, comfortable, private and furnished with all the aids necessary for a complete discussion should be available for this purpose. Also, these groups will often require an examination-treatment room for procedures which cannot be appropriately carried on at the bedside.

Another important teaching function on the nursing unit is the preparation of patient cases by medical students for presentation to the staff and consultants. This requires, in addition to the interview, examination and work space mentioned previously, a room where the student, away from the patients, can present his case with all its supporting materials. If an ambulant patient and only a small group is involved, a room within the nursing unit itself should be available. When more than a dozen or so are involved, or when a bedridden patient is to be personally involved in the presentation of the case, the classroom on the floor will be required.

Small groups of health science personnel

Nurses, dietitians, and social workers will all have occasion to meet with a single patient or a small group of patients to discuss such things as nutrition, types of diet, hospital care procedures, or adjustment to home life. These are learning experiences as well as patient care activities, and require facilities for interviewing, counseling, and meeting in small groups. Some small, more formal scheduled classes for these and other health science students and trainees will be conducted in the nursing unit.

The "team concept" on the nursing unit

Two significant trends in medical education bear directly on the nature of educational activities to be accommodated within the nursing unit. First, the complexities and resulting specialization of functions in patient care have led to a concern that medical science training involve all of the members of the medical team. Doctor, nurse, therapist, psychologist, and dietitian should work and learn together in order to understand each others' roles, experience, attitudes and limitations in relation to the patient, his illness, and recovery. This "team concept" of learning and training implies inter-disciplinary conferences, seminars, case presentations, discussions, and other experiences when the team will be brought together in the nursing unit, as well as in other sections of the hospital.

Continuing education in the nursing unit

Secondly, the continually changing practices demand that practitioners return to the teaching environment periodically to up-date and supplement their training. As previously noted, this process of post-graduate or continuing education may take place in many locations within the teaching hospital, *including* the nursing unit. The educational facilities provided in the nursing unit must, therefore, anticipate the growing need for this type of life-long learning, not only for the medical doctor, but for other members of the health team.

Facilities for recruitment

Although not strictly an educational concern, consideration must be given to the value of adequate facilities in the nursing unit as a recruitment incentive. House officers contribute significantly to the operation of a *VA* hospital and adequate offices, conference rooms, and examination-treatment facilities for their use may be as important as remuneration and potential learning experiences in the recruiting of residents for *VA* hospitals.

Facility Needs and Planning Considerations

Patient rooms for teaching

Within the nursing unit, the patient bedrooms have some merit as an environment for certain teaching functions when the learning group is no more than six persons. (See Appendix C "Bedside Teaching — An Overview"). Consideration must, therefore, be given to the planning of the patient room to make it effective for teaching. Adequate, adjustable light for examination purposes must be provided, the room must be planned to allow the group to gather around the bed without rearranging the furniture, and means must be available to communicate with other points in the hospital in order to bring the proper people, equipment and information to the bedside.

In addition, however, other types of educational facilities are necessary within each nursing unit.

Recommended facilities

1. *An examination-treatment room* which has adequate space and specialized equipment, and which is planned specifically for the various educational functions that have been reviewed.

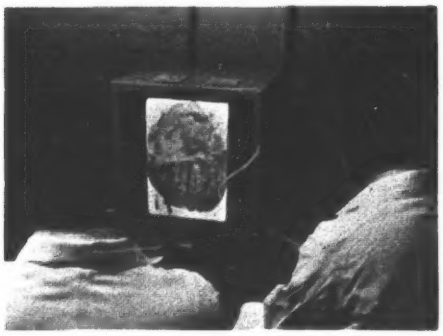
2. *A conference-discussion room* for the many small group, informal learning activities requiring members of the group to discuss and talk and interact together, away from the patients, and with the availability of instructional aids.
3. *An office-work area* which provides residents, students, and trainees with a private place conducive to performing necessary individual tasks and to establishing an identity with the nursing unit.

These rooms not unique

The provision of these facilities is not a unique recommendation in the planning of hospitals for teaching. Rather, the need for these rooms in the nursing unit has been substantiated from many sources, but their actual inclusion in construction is seldom realized.

Facilities arranged as a "teaching unit"

These facilities should be considered as a suite within the nursing unit to facilitate the conduct of educational activities. Being directly accessible and immediately available to the staff and people within the unit, they serve to simulate the conduct and relationships of private office practice. Furthermore, the suite should be located in close proximity to the nursing station to facilitate servicing and staffing, and should be near the major access to the nursing unit. Depending on the basic form of the nursing floor, this suite would be related to the other elements of the nursing unit as shown in the relationship diagram on page 138.



The conference room should be designed to permit extensive use of information display systems. The projectors used in this room would be mounted on carts for ease of movement, and stored in the area provided adjacent to the classroom serving the floor. Ease of movement of these projectors and other equipment between the classroom, the storage area, and the various conference rooms on the floor should be considered in planning.

Designing the nursing station for the health team

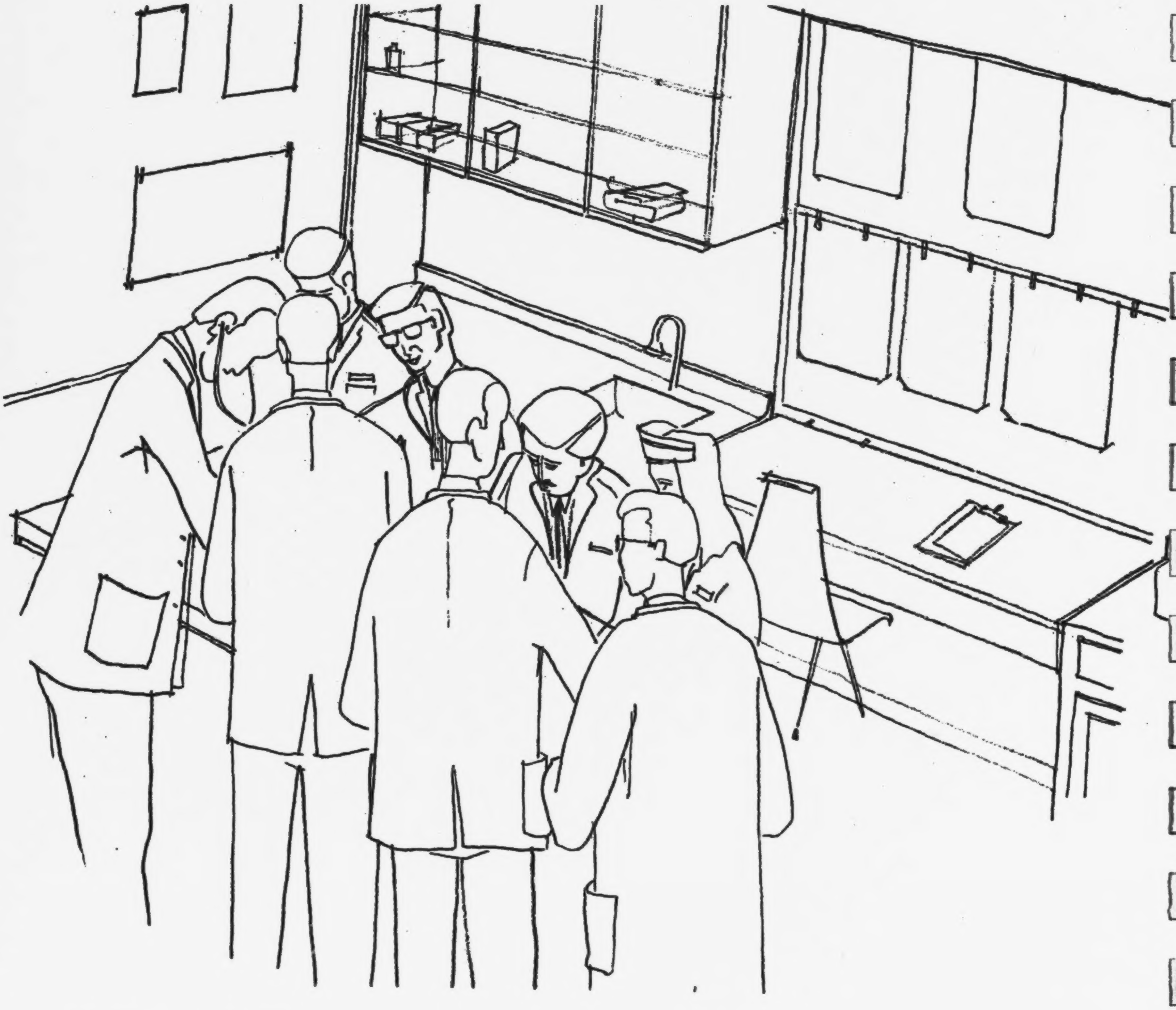
If the hospital desires to encourage the concept of health team learning, the nursing station and its adjunct spaces should be designed to facilitate this. Not only should some additional space be provided in areas such as the nursing station and medication room, but the interrelationship and juxtaposition of spaces become significant. One such team-oriented facility, incorporating all the basic facilities and the "teaching suite", is illustrated on page 138.

Finally, it is evident that clinical research — the detailed study of illness, treatment and care at the bedside — will expand. Nursing units should be planned to accommodate expanded clinical investigations; the provision of a treatment-examination room, conference room and work-study area is a major step in this direction. Provision of readily accessible storage facilities for special equipment and for the temporary location of special laboratory functions should also be considered as space is allocated.

The three recommended facilities — the examination-treatment room, the conference-discussion room, and the office-work area—are described and illustrated in detail as facilities N-1, N-2, and N-3 respectively.

N-I

EXAMINATION-TREATMENT ROOM



INTERIOR PERSPECTIVE

N-I

EXAMINATION - TREATMENT ROOM

PURPOSE:

A well-designed and properly equipped facility which serves not only for routine patient examination and treatment, but particularly as the appropriate place on the nursing unit in which to train residents, students and health science personnel in these procedures.

PRINCIPAL USES:

- patient care and treatment by residents, and by various members of the health team and their trainees.
- observation, by students and trainees, of various diagnostic procedures and forms of treatment.
- patient examination, history taking, and physical diagnosis by medical students and clerks.
- pre- and post-round demonstrations.
- conduct of rounds when the bedside is inappropriate.
- certain aspects of clinical research.

USERS:

Patients and personnel of the nursing unit involved with patient care and treatment, and with training, including:

- residents (2-4)
- students and student clerks (4-6)
- nursing staff and trainees (4-6)
- appropriate health science trainees (1-3 therapists and technicians)
- clinical research fellows (1)
- staff physicians (2-3)
- consultants (1-2)
- physicians (2-3 for post-graduate training and resarch)

QUANTITY:

One within each nursing unit in the hospital.

SPACE REQUIREMENTS:

- accommodate a patient on the examination table, 2 to 4 persons attending the patient, and as many as 8 observers.
- provide for the patient to be brought into room in bed and be transferred to table.
- provide for appropriate diagnostic and treatment apparatus.

SIZE:

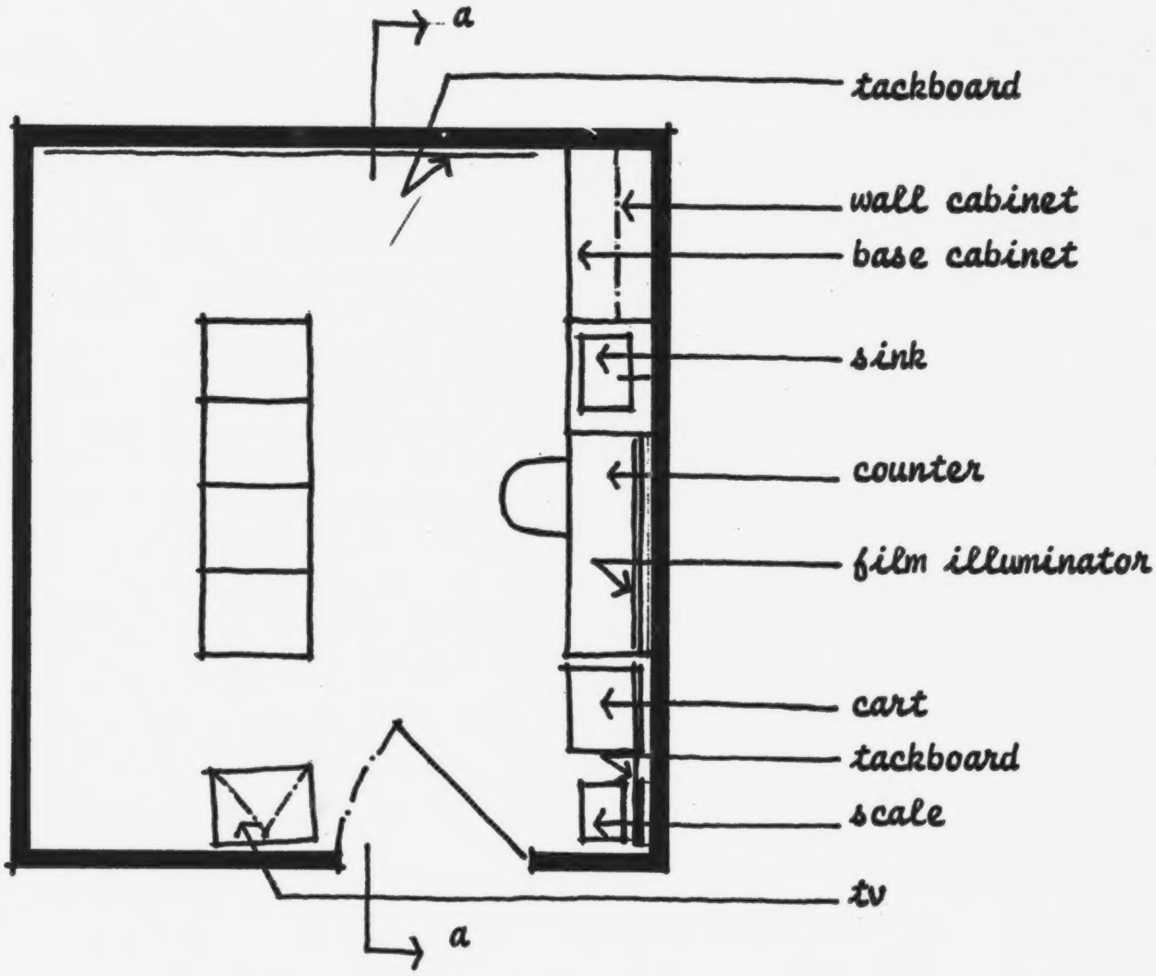
- minimum recommended width — 10 feet.
- minimum recommended area — 140 square feet.

LOCATION:

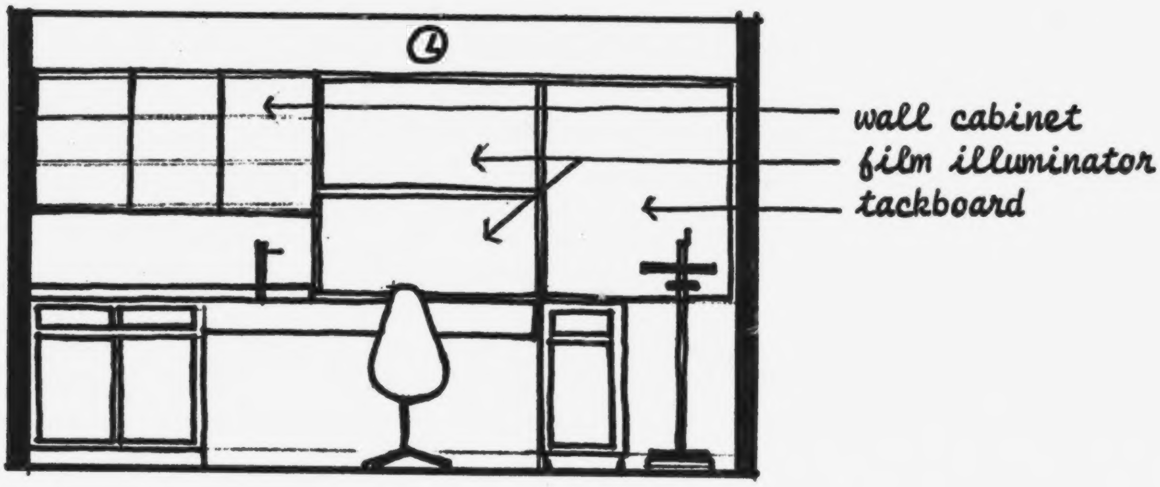
- within the administrative area of the nursing unit as part of the "teaching suite" (see diagrams on pages 138 and 139).
- accessible directly from major corridor of the nursing unit.

N-I

EXAMINATION-TREATMENT ROOM


a
tackboard
wall cabinet
base cabinet
sink
counter
film illuminator
cart
tackboard
scale
tv
a

FLOOR PLAN


℄
wall cabinet
film illuminator
tackboard

SECTION A-A

N-I

EXAMINATION-TREATMENT ROOM

FURNISHINGS AND EQUIPMENT:

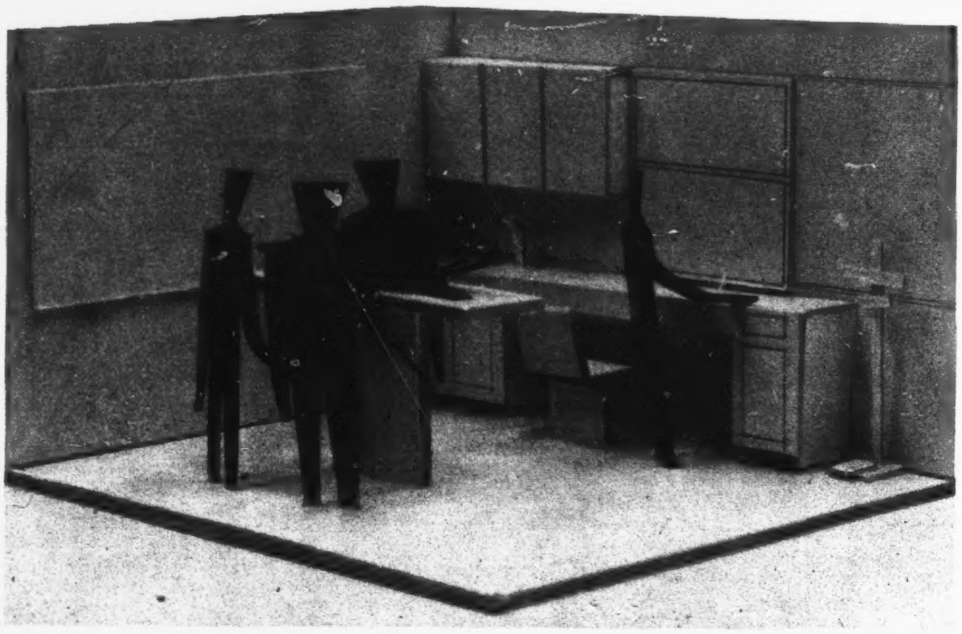
- typical equipment and furnishings for patient examination and treatment including lavatory
- counter space for charting and noting
- wall-mounted X-ray film illuminators (4 linear feet minimum)
- tackboards as sections of wall surface
- 27" TV receiver — wall-mounted
- inter-communication (audio) input-output
- 2-4 loose footstools for use by observers
- in some rooms, provide facilities for TV origination

LIGHTING:

Overall illumination of 80 footcandles with supplementary, high level lighting directed on the examination table.

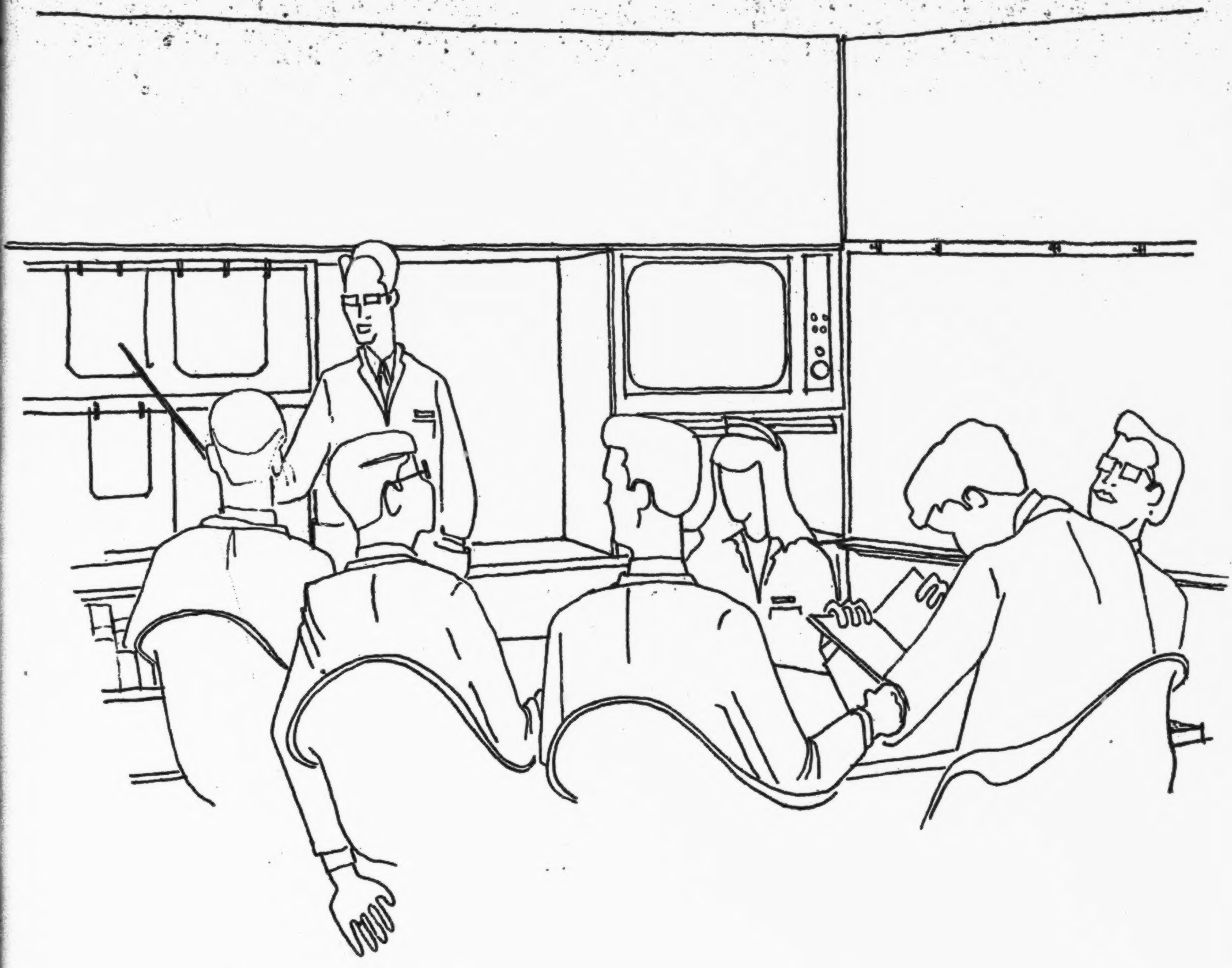
ACOUSTICS:

Acoustical isolation from adjoining spaces.



VIEW OF MODEL

N-2
CONFERENCE ROOM



INTERIOR PERSPECTIVE

N-2

CONFERENCE ROOM

PURPOSE:

To provide a productive setting for the generally informal teaching-learning situations which take place within the nursing unit and which consist primarily of small, inter-active groups. The character should be that of a conference room in a suite of private, professional offices.

PRINCIPAL USES:

- presentation of cases — "write-ups" by student clerks.
- informal discussions, seminars and conferences involving various combinations of personnel.
- preparatory and review sessions preceding and following rounds.
- patient care conferences.
- conferences with patients and families.
- small group interviews with patients and interviews with observers.
- some small, formal, scheduled classes.
- off-hour study and review groups.
- small group therapy sessions (psychiatry).

USERS:

Ambulant patients and all personnel involved with patient care and training on the nursing unit including:

- residents (2-4)
- students and student clerks (4-6)
- nursing staff and trainees (4-6)
- health scientists (2-4 social workers, dietitians, psychologists therapists)
- staff physicians (2-3)
- consultants (1-2)
- physicians (2-3 for post-graduate training)

QUANTITY:

One within each nursing unit of the hospital

SPACE REQUIREMENTS:

- accommodate 10 to 14 persons gathered around a conference table.
- permit a patient in a wheelchair to enter and position himself at the table.

SIZE:

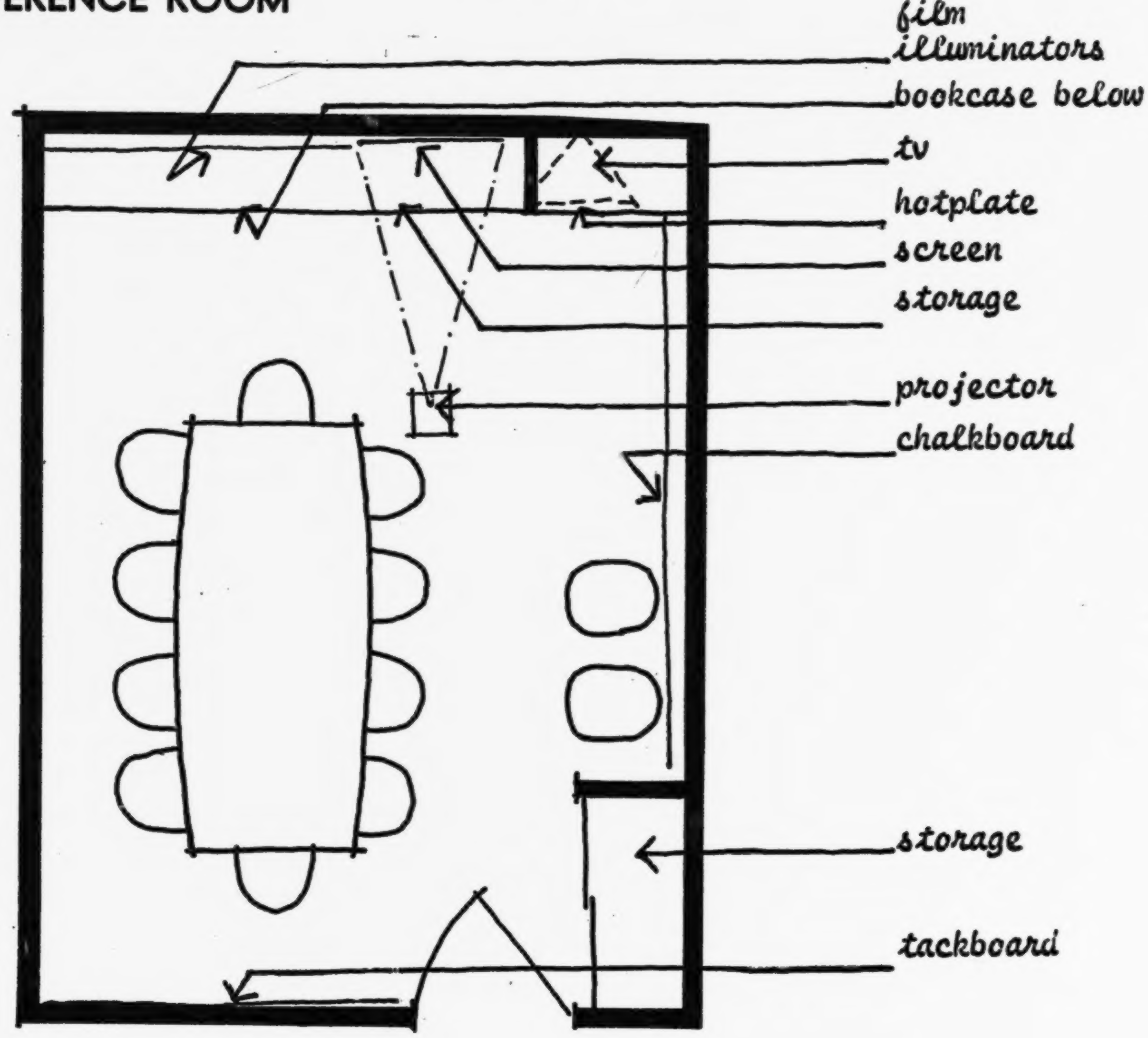
- minimum recommended width — 12 feet.
- range of minimum areas for 10 to 14 persons—150 to 180 square feet.

LOCATION:

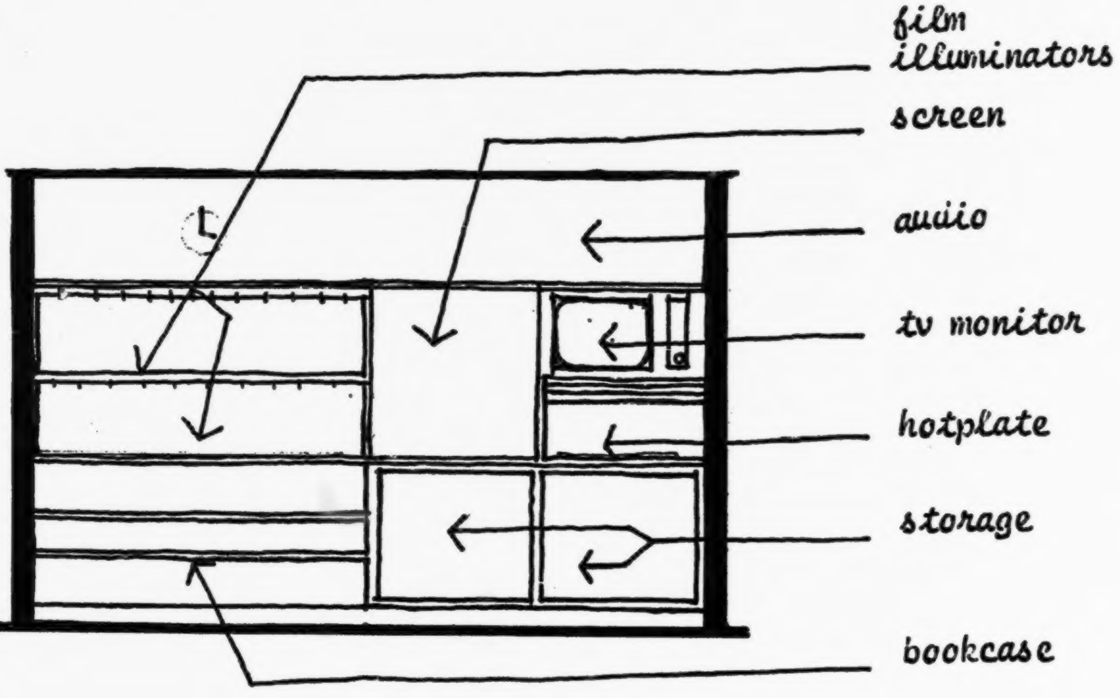
- within the administrative area of the nursing unit as part of the "teaching suite."
- accessible directly from main corridor of the nursing unit.

N-2

CONFERENCE ROOM


film illuminators
bookcase below
tv
hotplate
screen
storage
projector
chalkboard
storage
tackboard

PLAN A


film illuminators
screen
audio
tv monitor
hotplate
storage
bookcase

ELEVATION OF DISPLAY WALL

N-2

CONFERENCE ROOM

FURNISHINGS AND EQUIPMENT:

- conference table (sectional for flexible arrangements)
- movable arm chairs
- wall mounted X-ray film illuminators (8 linear feet minimum)
- tackboards and chalkboards as wall surfaces
- 3 x 3 foot wall-mounted projection screen (high gain)
- wall surfaces as supplementary projection surfaces
- 27" wall mounted TV receiver
- receptacle for TV origination (optional)
- inter-communication (audio) input-output
- minimal storage facilities for supplies and instructional materials
- projection equipment mounted on movable carts and available from the storage area adjacent to the classroom on the floor
  - —2 x 2 and 3¼ x 4 slide projectors
  - —8 and 16 mm film projectors
  - —overhead projector

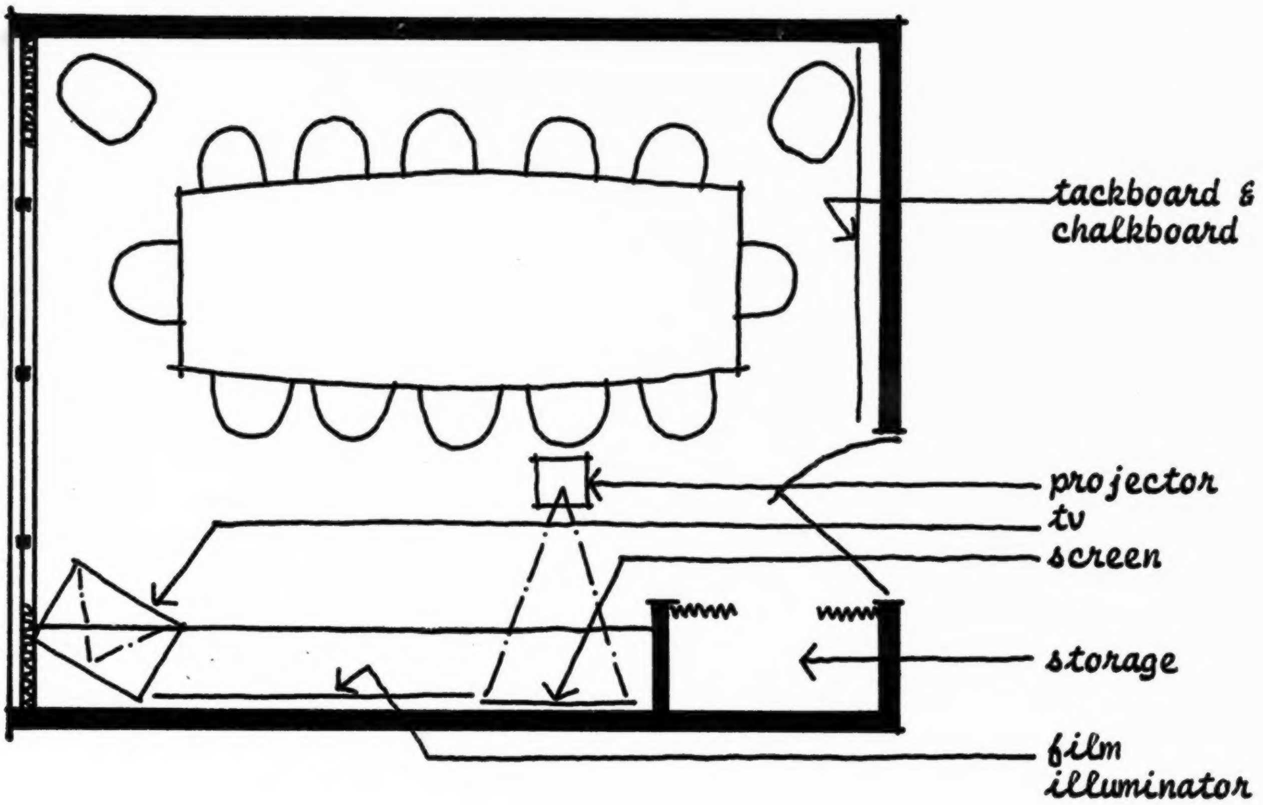
LIGHTING:

Directional system arranged to provide two levels of illumination

- —low level which will place no more than 2 footcandles of ambient light on the screen surface, but which will be sufficient for note-taking.
- —high level of 40-50 footcandles on the working surface.

ACOUSTICS:

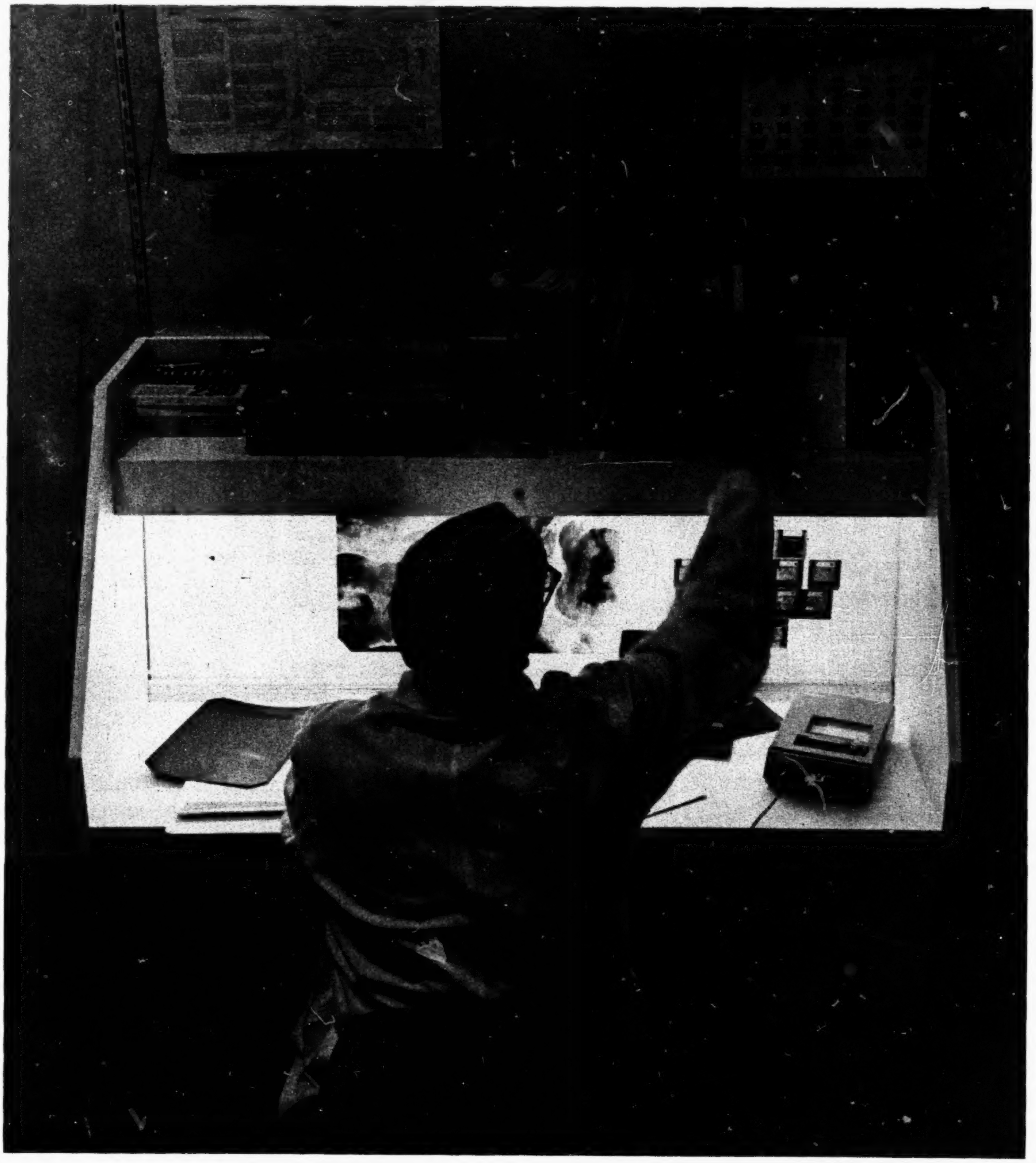
Acoustical isolation from adjoining spaces.



PLAN B

N-3

OFFICE-WORK AREA



STUDENT AT THE WORK-STUDY CARREL

N-3

OFFICE-WORK AREA

PURPOSE:

To provide a dignified and efficient place for work, study, and interviewing within the nursing unit towards upgrading the administration of patient care and the conduct of education programs. These rooms should have the character of offices in a private practice suite.

PRINCIPAL USES:

- accommodating office-centered functions relating to care and education as conducted by the resident — charting, report and record review, patient interviewing and history taking, coordinating patient care and treatment, studying, and coordinating education.
- preparing cases and assignments, review records and reports, studying, and other individual learning activities required of student clerks and various trainees such as nurses, social workers, dietitians, psychologists, etc.
- encouraging informal learning by locating various students and trainees of the health care team together in a work-study relationship.
- providing "home-base" facilities — a place of identification — for those persons training in the nursing unit.
- patient interviewing and counseling.
- student and trainee counseling and individual guidance.

USERS:

Ambulant patients and those persons on the nursing unit who are directly involved as "learners" including:

- residents(2-4)
- students and student clerks (4-6)
- health science trainees (3-5 nurses, social workers, dietitians, phychologists, etc.)
- physicians (2-3 for post-graduate training)

QUANTITY:

One within each nursing unit of the hospital

SPACE REQUIREMENTS:

Provide for 9 to 15 persons as follows:

- 2-4 residents in private or semi-private offices (private offices in psychiatry)
- 5-10 students and trainees at "carrel-type" work stations
- provide an interview room accommodating 2 to 3 persons. (Normally provide 2 interview rooms in psychiatry.)
- allow wheelchair patient to enter interview room(s) and residents' offices.

SIZE:

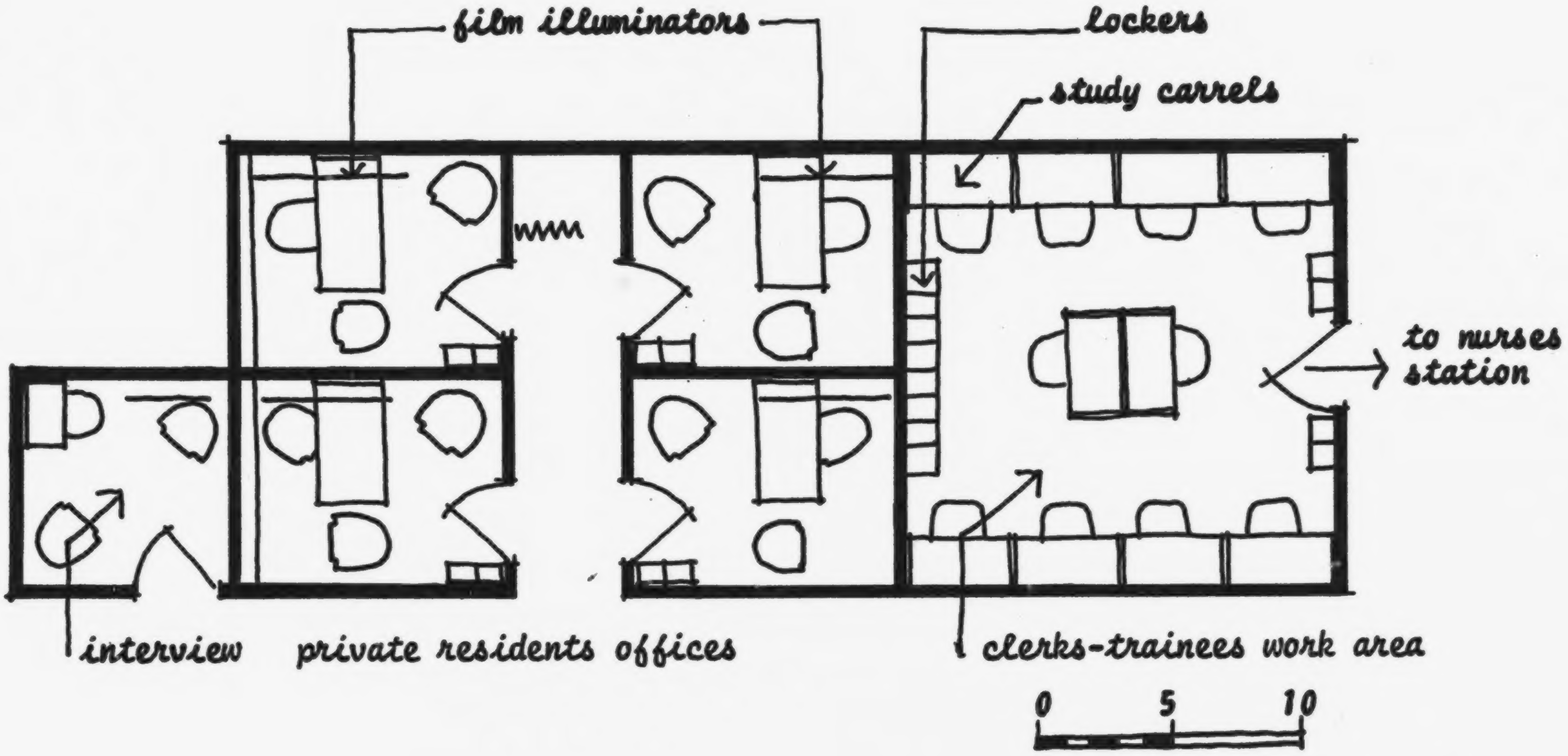
- semi-private office: minimum recommended area 140 sq. ft.
- private office: minimum recommended area 80 sq. ft.
- interview room: minimum recommended area 64 sq. ft.
- student-trainee area: 25 to 30 sq. ft. per work station

LOCATION:

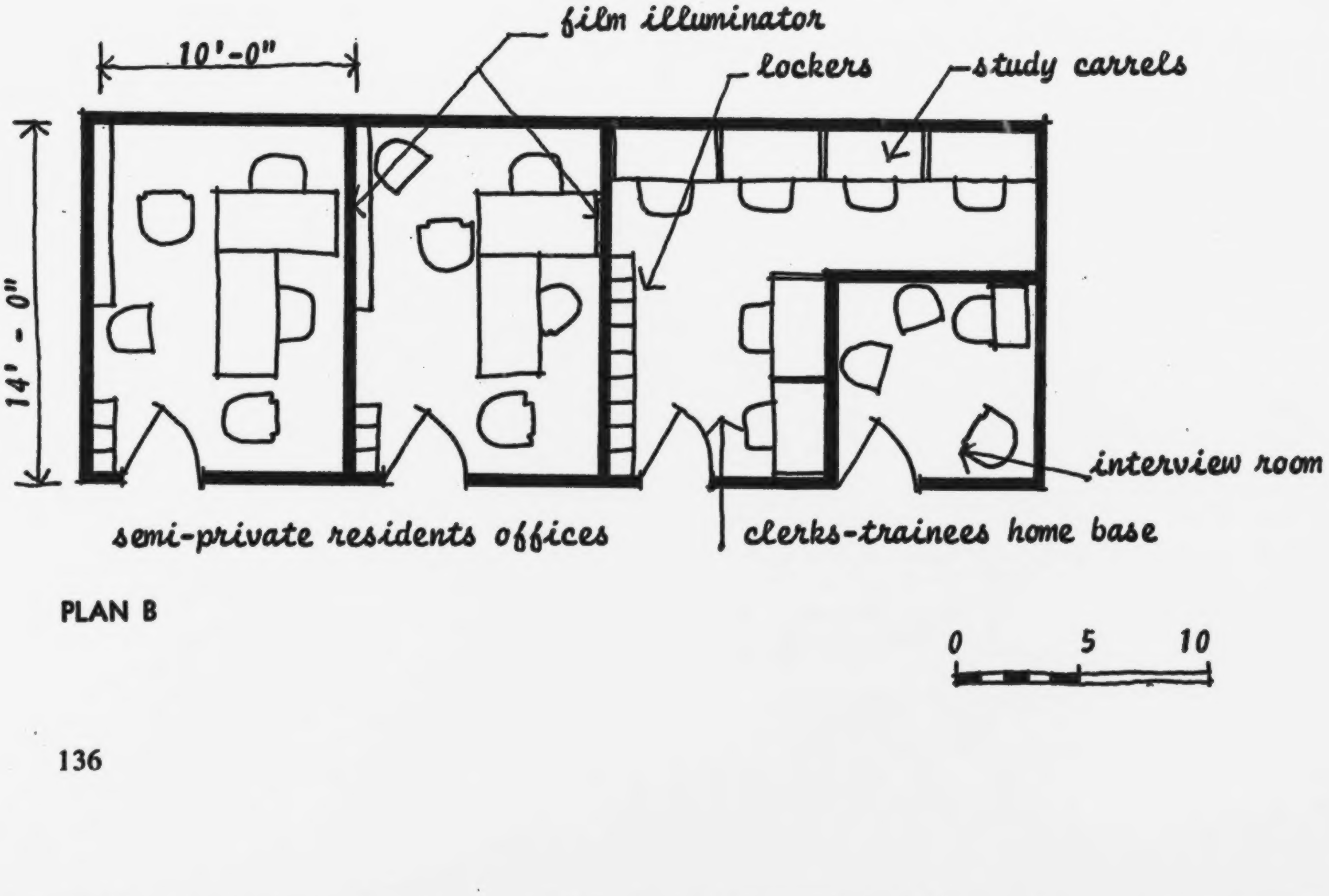
- within the administrative area of the nursing unit as part of the "teaching suite."
- accessible from major corridor of the nursing unit.

N-3

OFFICE-WORK AREA


film illuminators
lockers
study carrels
to nurses station
interview
private residents offices
clerks-trainees work area
0
5
10

PLAN A


film illuminator
10'-0"
lockers
study carrels
14' - 0"
interview room
semi-private residents offices
clerks-trainees home base
0
5
10

PLAN B

N-3

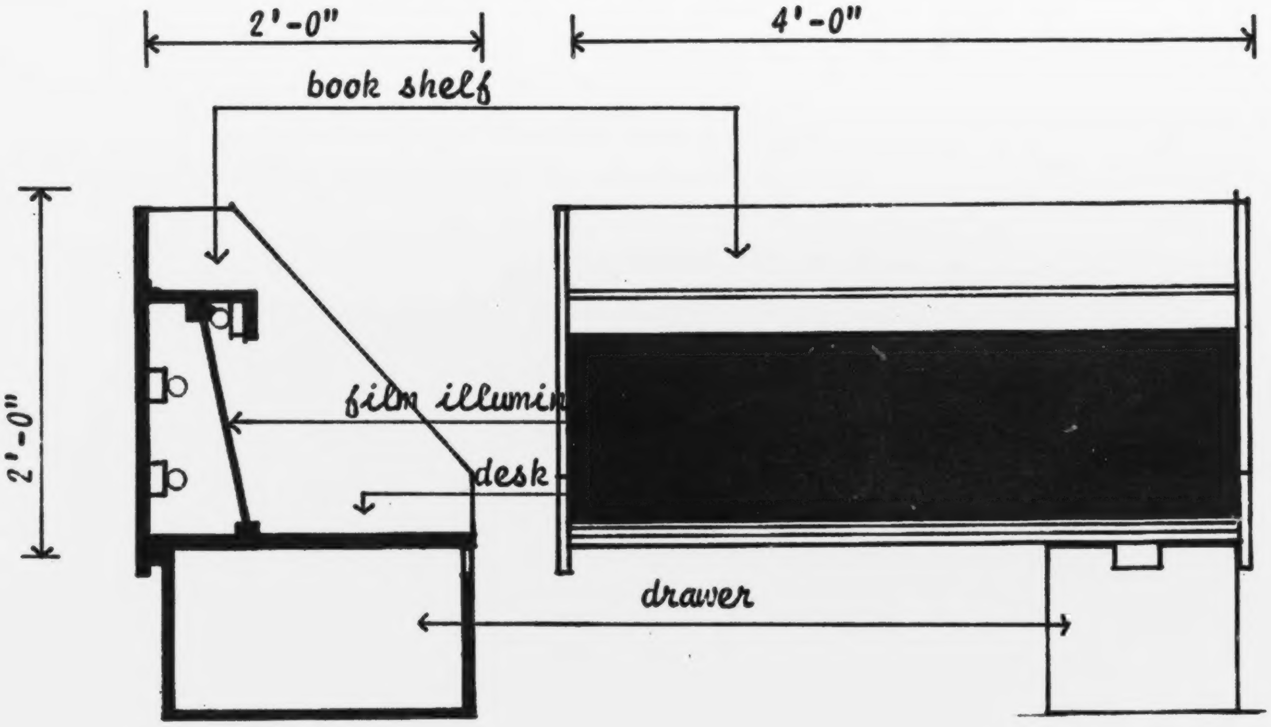
OFFICE-WORK AREA

FURNISHINGS AND EQUIPMENT:

- in the resident's office —
  - —intercom input-output
  - —desk(s), desk chair(s) and 1 or 2 comfortable side chairs
  - —book shelves
  - —locker(s)
  - —chalkboard and tackboard surfaces
  - —X-ray film illuminators
- in the student-trainee area —
  - —intercom input-output
  - —lockers
  - —individual work stations (carrels) each with book shelves, storage, individual light and film illuminator
- in the interview room —
  - —small desk and chair
  - —several comfortable lounge chairs
  - —carpeting
  - —chalkboard, tackboard and X-ray film illumination

LIGHTING: Overall illumination of 40 to 50 footcandles with individual lighting units for desks and work stations.

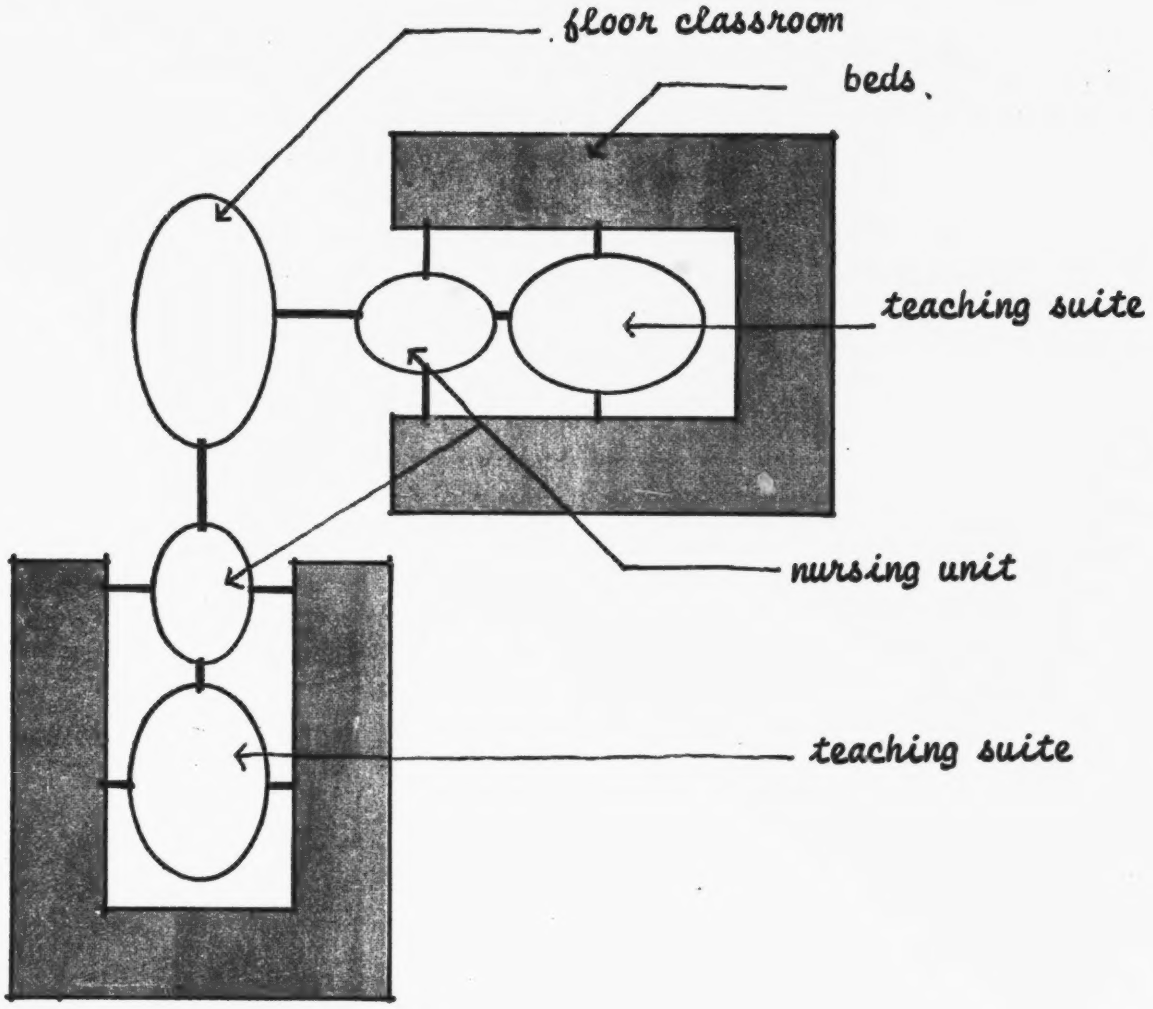
ACOUSTICS: Acoustical isolation from adjacent spaces; use of absorptive treatment materials in offices and work area.



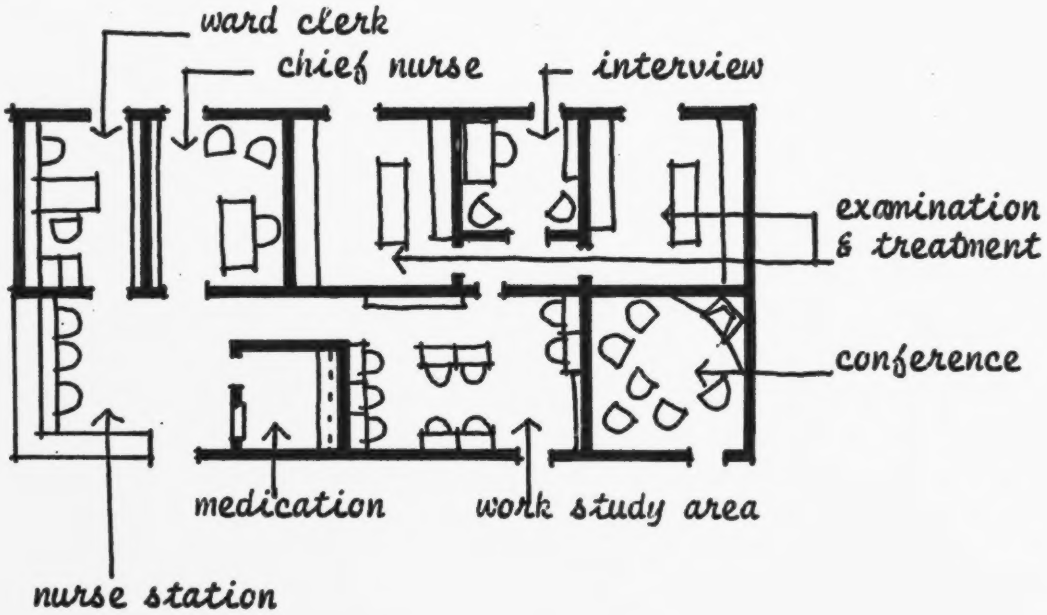
DETAILS OF THE WORK-STUDY CARREL

N-I, N-2, N-3

TEACHING SUITE


floor classroom
beds
teaching suite
nursing unit
teaching suite

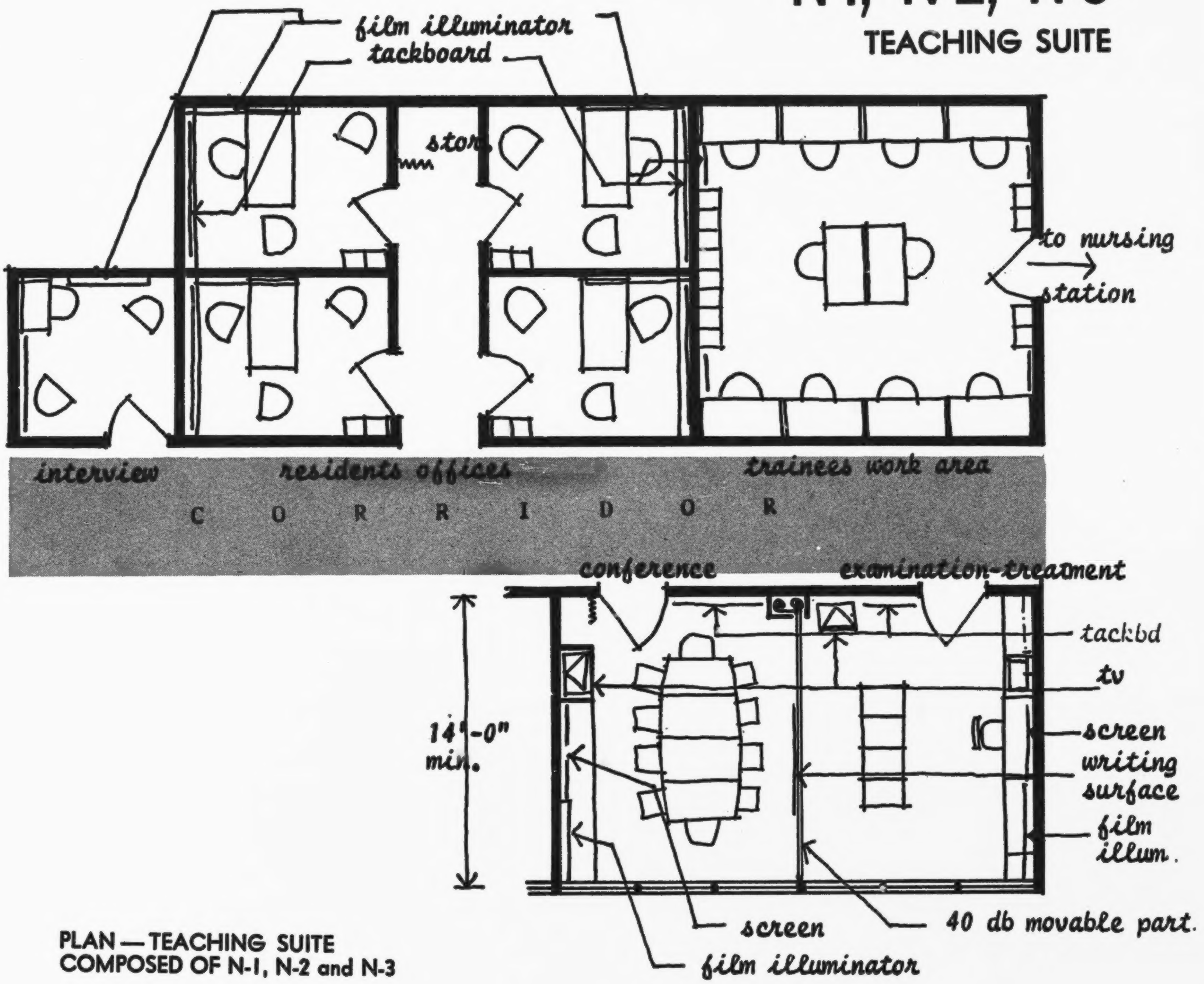
RELATIONSHIP DIAGRAM — ELEMENTS OF THE NURSING UNIT


ward clerk
chief nurse
interview
examination & treatment
conference
medication
work study area
nurse station

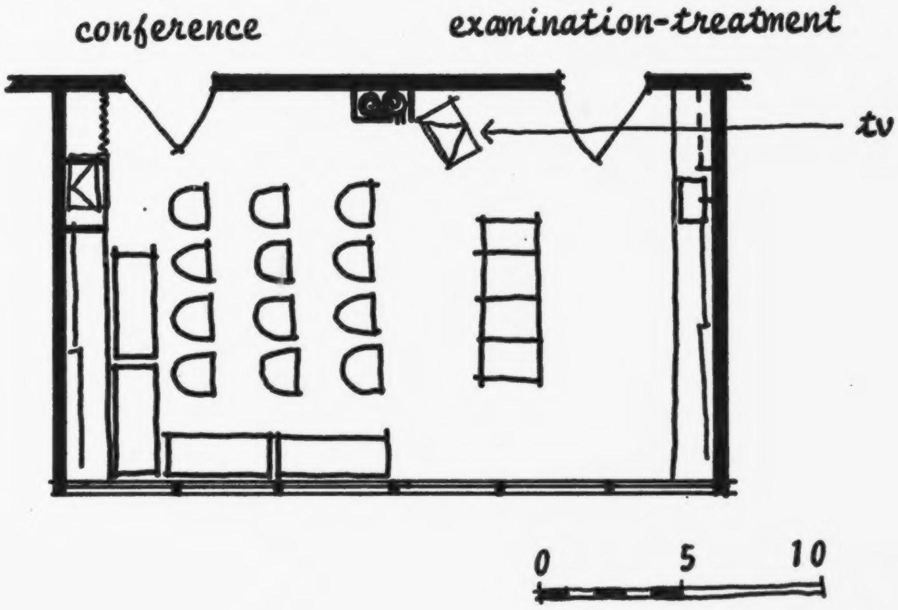
PLAN — FACILITIES FOR TEAM LEARNING

N-1, N-2, N-3

TEACHING SUITE


film illuminator
tackboard
stor.
to nursing station
interview
residents offices
trainees work area
CORRIDOR
conference
examination-treatment
tackbd
tv
screen
writing surface
film illum.
14'-0" min.
screen
40 db movable part.
film illuminator

PLAN — TEACHING SUITE COMPOSED OF N-1, N-2 and N-3


conference
examination-treatment
tv
0
5
10

PLAN — ALTERNATE ARRANGEMENT OF N-1 and N-2

5. PROGRAMMING AND PLANNING

Programming Educational Needs

Complexity of the hospital in planning

Thorough planning is the foundation for any useful building, and its importance is generally proportional to the complexity and significance of the structure itself. Of all the common types of buildings, the hospital is by far the most complex in nature, and certainly its significance, in terms of its value to society, can scarcely be questioned. It is generally accepted, therefore, that in hospital design, comprehensive and detailed advance planning is indispensable, and the techniques of hospital planning have engaged the best efforts of brilliant minds in many fields.

Programming must recognize education

The term "planning", in this context, must be considered in its broadest sense. As already explained, it includes much more than architectural planning, which is only its ultimate form of expression. Before planning can reach this stage, years may be spent in surveying, evaluation, analysis and, finally, programming. The need for fully comprehensive planning and thorough, detailed programming is well recognized in the *VA* System. There is doubt, though, as to whether the planning and programming adequately recognize educational needs, and one of the purposes here is not only to emphasize the necessity of this but to demonstrate its implications. A secondary concern is that present programming methods may, in some respects, be *too* rigidly disciplined to satisfy the specific local need for educational facilities.

Educational needs not directly related to beds

Before considering two illustrative examples of programming educational facilities, certain unique aspects of educational requirements should be noted. First, and most importantly, it should be recognized that the needs for educational space in the *VA* hospital are not, like other space requirements, related solely to the number of beds provided in the hospital. They depend also on the type and extent of educational programs and the proximity and available facilities of the affiliated medical school and medical center.

Provide all facilities to meet total need

It should be recognized also, as previously stated, that educational methods as well as student enrollment are probably even less predictable, over a period of years, than are the methods and procedures used in patient care and treatment, though both are characterized by constant change and expansion. Consequently, the space requirements for education are less susceptible to strict definition than are those for most other hospital functions with the exception, of course, of research. It would probably be unrealistic at this time to recommend the programming of unidentified space, as its conclusive justification would be difficult. Nevertheless, if the *total educational program* is to be supported in the hospital, *all of the facilities recommended as essential to the program are justified* and should be provided, and they should be fully equipped, to provide optimum usefulness.

Case Study Programs

Case studies illustrate programming

To illustrate the nature and number of educational spaces needed in various types of *VA* hospitals, the following two hypothetical case study programs are presented, one for a 720-bed hospital, and the other for a hospital having 1040 beds. In each instance, the data concerning the hospital, its resident, student and trainee personnel, the distribution and size of its nursing services, and its assumed relationship to the affiliated medical school, have been supplied by the *VA* Central Office as representative of a typical situation. It should be noted that in both cases the educational facilities programmed are considered to be the minimum required, and that these requirements vary, depending not only on the size of the hospital but the nature of its services, personnel and relationship to the medical school. Also, that without additional information regarding the facilities provided by the school, the programming of certain hospital-wide educational facilities is necessarily indefinite.

Case Study No. I

EDUCATIONAL FACILITIES FOR A 720-BED GM&S VA HOSPITAL

A. Conditions

1. A 720-bed GM&S *VA* Hospital will be affiliated and in close physical proximity to a medical school and medical center with medical and health science education and training programs. The medical school has 100 students in each year; each class will be at the *VA* hospital for physical diagnosis and certain phases of the student clerkship. There is also a typical range of residencies.
2. At any one time, the following types and numbers of persons will be receiving training in the hospital:
   Medical students — 105
   (35% of the last three years)
   Nurses — 15
   Social Workers — 8
   Dietitians — 16
   Clinical psychology trainees — 16
   Occupational therapists — 8
   Physical therapists — 8
   Residents — 80 total
   - Psychiatry 25
   - Medicine 20
   - Surgery 20
   - Radiology 4
   - Neurology 3
   - PM&R 2
   - Pathology 6
3. The distribution of beds is as follows:

Psychiatric beds	— 240	(8 nursing units @ 30 beds each)
PM&R	— 40	(1 nursing unit @ 40 beds each)
Neurology	— 40	(1 nursing unit @ 40 beds each)
Surgery	— 200	(5 nursing units @ 40 beds each)
Medicine	— 200	(5 nursing units @ 40 beds each)
Total beds	720	— 20 nursing units

4. In this particular hospital there will be two nursing units per floor.

B. Recommended Educational Facilities

Based on these conditions, an appropriate program of educational facilities for this hospital would be:

1. On each *medical and surgical nursing unit* (including neurology and PM&R)
   - 1 office-work area with
     — Semi-private or private offices for 4 residents
     — work room for 6 to 8 students and trainees
     — interview room
   - 1 examination-treatment room
     (designed to support teaching)
   - 1 conference room seating 10 to 12
2. On each *psychiatric nursing unit:*
   - 1 office-work area with:
     — private offices for 4 residents
     — work room for 8 to 10 students and trainees
     — 2 interview rooms
   - 1 examination-treatment room
     (designed to support teaching)
   - 1 conference room seating 12 to 14
3. On each *psychiatric nursing floor:* [except for the floor which contains the service-wide facilities (Item 6 below)]
   - 1 classroom seating 20 to 24, which is designed to be divided into two spaces each serving as a group therapy room accommodating 10 to 12 persons.
4. On each of the *medical and surgical nursing floors:* [except for the floors which contain the service-wide facilities (Item 5 below)]
   - 1 class room seating 20 to 24 persons and designed specifically for teaching programs in the health sciences.
5. The *medical and surgical services* should *each* have:
   - 1 teaching room seating 40 to 50
   - 1 resource sub-center for 15-20, and including a clinical laboratory.
   - for surgery only:
     1 conference room seating 8 to 10 and located in the operating suite.
     Observation of surgery by TV

6. The *psychiatric service* should have:
   - 1 teaching room seating 40 to 50
   - 1 resource sub-center seating 15 to 20
   - 1 group therapy suite with observation and TV origination core
7. For *PM&R Therapy Area:*
   - semi-private offices for 2 residents
   - work-study carrels for 16 trainees
   - 1 conference room seating 18 to 20 persons
   - design of all therapy and rehabilitative facilities to incorporate the additional space and equipment required for teaching-training programs.
8. For *pathology:*
   - semi-private offices for 6 residents
   - 1 educational suite as part of the clinical laboratories
   - autopsy facilities designed for training programs and TV origination
9. For *radiology:*
   - semi-private offices for 4 residents
   - 1 educational suite as part of the radiology service
10. For *medical records:*
    - 2-4 review and research cubicles
11. For *dietetics:*
    - 1 conference room seating 18 to 20, related to Chief Dietitian's office
12. For *nursing service:*
    - 1 conference room seating 18 to 20 and related to office of Associate Chief Nurse for Training
    - 1 nursing demonstration room
    - lounge and locker facilities
13. For the *common use of all services and departments:*
    - 1 class room seating 20 to 24 persons
    - 1 large teaching room seating 60 to 80 with necessary auxiliary facilities

      } located in general administrative area of hospital
    - 1 "home environment" demonstration suite
14. For the *out-patient department:*
    - examination-treatment and conference modules as required by the patient load and the extent of educational programs which utilize the OPD
    - seminar-conference rooms and work room (size and number as required by educational programs)
    - 1 class room (capacity as required by educational programs)
15. To support hospital-wide health science teaching and training, in-service training and continuing education programs:
    - a learning resources center — this library-type facility will make accessible or coordinate the accessibility of all necessary instructional and learning resources. Its size will depend on the extent and availability of similar resources in the medical school-medical center.
    - an educational support center — this unit will be responsible for film, slide, graphic arts, and tape materials production, TV usage, and maintenance and support functions; its size and the details of its staffing and functioning would depend on the availability of similar facilities on a cooperative basis with the medical school and medical center.
    - a teaching auditorium — this facility will be needed for hospital-wide teaching functions and for continuing education programs in conjunction with the medical community. Its location and size will depend on the availability of other auditorium facilities in the medical center appropriately designed for educational purposes. If facilities are not available elsewhere, this hospital should provide a teaching auditorium seating approximately 300. It would also be used for patient entertainment and other non-teaching functions.

Case Study No. 2

EDUCATIONAL FACILITIES FOR A 1040 GM&S VA HOSPITAL

A. Conditions

1. This 1040 bed hospital is closely affiliated, by program and physical proximity, to a medical school with medical classes of 90 students each. Various health science training programs will be conducted through additional affiliations, and residencies in 11 specialties will be provided.
2. At any one time, the following persons will be receiving training in the hospital:

   Medical students — 40 1st and 2nd year students for physical diagnosis and 78 3rd and 4th year clerks
   Psychologists — 4
   Social Workers — 6
   Laboratory Technicians — 8
   Pharmacists — 2
   PM&R Therapists — 7
   Dietitians — 1
   Audiologists — 2
   Mental Hygiene
   - Social Workers — 2
   - Psychologists — 2

   Residents — 71 total

• Psychiatry	21
• Dentistry	4
• EENT	2
• Urology	2
• Medicine	11
• Neurology	4
• Nephrology	3
• Pathology	4
• PM&R	4
• Radiology	3
• Surgery	13

3. The distribution of beds is as follows:

   Psychiatric — 480 (16 nursing units @ 30 beds each)
   Medicine — 200 (5 nursing units @ 40 beds each)
   Surgery — 240 (6 nursing units) @ 40 beds each)
   Neurology — 80 (2 nursing units @ 40 beds each)
   Special (Intensive Care) — 40 (1 nursing unit)
   Total beds 1040 —30 nursing units

4. In this particular hospital there will be four nursing units per floor.

B. Recommended Educational Facilities

The following program of educational facilities would be appropriate for this hospital based on the preceding information:

1. On each *psychiatric nursing unit:*
   - 1 office-work area with
     - — private offices for 2 residents
     - — work room for 4 to 6 students and trainees
     - — 2 interview rooms
   - 1 examination-treatment room for teaching
   - 1 conference room seating 8 to 10
2. On all *other nursing units:*
   - 1 office-work area with:
     - — semi-private or private offices for 3 or 4 residents
     - — work room for 4 to 6 students and trainees
     - — 1 interview room
   - 1 examination-treatment room
   - 1 conference room seating 10 to 12
3. On each *psychiatric nursing floor* (except for the floor containing the service-related facilities):
   - 1 classroom seating 24 to 32, which can be divided into two group therapy rooms.
4. On all *other nursing floors:*
   - 1 classroom seating 32 to 40, designed for multi-discipline teaching in the health sciences
   - 1 student clinical laboratory
5. The *psychiatric service* should have:
   - 1 teaching room seating 50 to 60
   - 1 resource sub-center seating 20 to 25
   - 1 group therapy suite with TV origination and observation
6. The *medical and surgical service* should *each* have:
   - 1 resource sub-center seating 10 to 15
7. *Surgery* should have:
   - 1 conference room seating 6 to 8 for each two surgical operating rooms. (These would be located in the operating suite).
   - observation of surgery by TV

8. For *dentistry:*
   - 4 operating rooms and adjacent office-cubicles
   - 1 conference room seating 10-12 related to the Chief's office
9. For *pathology:*
   - semi-private offices for 4 residents
   - 1 educational suite as part of the clinical laboratories and including work-study carrels for 10 to 12 students and trainees
   - autopsy facilities designed for training with TV observation
10. For *radiology:*
    - semi-private offices for 3-4 residents
    - 1 educational suite as part of the service
11. For *physical medicine and rehabilitation:*
    - semi-private offices for 4 residents
    - work-study facilities for 8-10 students and trainees
    - 1 conference room seating 12-14 persons
    - therapy and rehabilitative facilities designed to incorporate teaching-training programs
12. For *pharmacy:*
    - work-study carrels for 2-4 trainees and a conference room for 8 to 10 as part of the service
13. For the *common use of all departments and services:*
    - 2 classrooms each seating 18 to 24 persons (one of these would be located to be shared by Pathology and Radiology; the other for use by services in the Administrative area).
    - 1 large teaching room seating 60 to 80
    - 1 "home environment" demonstration suite
14. For *nursing service:*
    (even though no professional nursing students will be involved, there will probably be in-service and nursing aide training programs requiring a nursing-demonstration room with 2 beds)
15. For *EENT Clinic:*
    (assuming Audiology related):
    - private offices for 2 to 4 residents
    - work-study carrels for 4 to 6 students and trainees
    - small conference room seating 8 to 10
16. For *medical records:*
    - 3-5 review and research cubicles
17. For the *out-patient department:*
    - examination-treatment and conference modules as required by the patient load and the extent of educational programs which utilize the OPD
    - seminar-conference rooms and work room (size and number as required by educational programs)
    - 1 class room (capacity as required by educational programs)
18. To support hospital-wide health science teach- and training, in-service training and continuing education programs:
    - a learning resource center — this library-type facility will make accessible or co-ordinate the accessibility of all necessary instructional and learning resources. Its size will depend on the extent and availability of similar resources in the medical school-medical center.
    - an educational support center — this unit will be responsible for film, slide, graphic arts, and tape materials production, TV usage, and maintenance and support functions; its size and the details of its staffing and functioning would depend on the availability of similar facilities on a co-operative basis with the medical school and medical center.
    - a teaching auditorium — this facility will be needed for hospital-wide teaching functions and for continuing education programs in conjunction with the medical community. Its location and size will depend on the availability of other auditorium facilities in the medical center appropriately designed for educational purposes. If facilities are not available elsewhere, this hospital should provide a teaching auditorium seating approximately 500. It would also be used for patient entertainment and other non-teaching functions.

Planning and Design Procedures in the VA System

Understanding of planning procedures essential to ultimate objective

Although the basic concern of this project is with educational facilities, it is not limited exclusively to these spaces. To insure maximum functional value, they must be considered in relationship to the whole hospital, and in order to provide design guidance which has the greatest practical value and likelihood of realization, a knowledge of *VA*'s general planning policies and procedures is important.

Since the ultimate objective is the actual *provision* of these educational facilities — not simply the provision of designs for them — it has seemed advisable to look beyond the design stage, and to examine the procedures and practical problems associated with subsequent planning. For these reasons it was felt that an understanding of the procedures followed in the planning or *VA* hospitals is essential to intelligent recommendations, and a limited study has been made of them. Although not originally contemplated in the scope of the project, and not requested by the Sponsor, it appeared that an objective critical review of these practices, though necessarily of limited scope, might be of tangent value.

Summary of current procedures

It is understood that current practice in the programming and planning of new *VA* relocation hospitals follows the pattern outlined in the following summary:

Defining a need

First, of course, there is the recognition that the need for a new *VA* hospital exists or is developing in a certain geographical area. This need having been confirmed by statistical data, it is further studied by the staff of the Chief Medical Director, to define in general terms the type of facility required, and a detailed proposal is prepared. This is submitted to the Administrator for review, and if he approves it, he, in turn requests the Bureau of the Budget to ask for Presidential approval to proceed with the planning of the project. The President's formal approval is required at this point, if the project is to be activated.

Development of the Master Plan

This approval being granted, the Hospital Construction Service is then authorized to proceed with planning, and the preparation of a detailed progress schedule. Site studies are begun, and work is started on the "Master Plan", — a comprehensive detailed program for the hospital. In the development of this Master Plan, the Hospital Construction Service enlists the cooperation of not only all interested medical and administrative services but also of representatives of the affiliated medical school and of the *VA* hospital involved. Upon its completion, this Master Plan is first submitted to the Chief Medical Director for approval, then is subjected to critical detailed review by the *VA* Controller, and finally it is presented to the Administrator for his approval. Following this, it is reviewed by the Bureau of the Budget to establish approved space requirements and a target cost for the hospital.

Approval of the block layout

The Master Plan is then turned over to the Preliminary Planning Service of the Assistant Administrator for Construction which, in close cooperation with the HCS, develops the first graphic study of general space relationships, — the "block layout". This layout is presented for review and criticisms to the Program Directors of the interested services, and also, if appropriate, to the officials of the affiliated medical school and the *VA* Hospital staff, and desired changes, if any, are mutually agreed upon. The "corrected" layout is then presented jointly by the HCS and the Assistant Administrator for Construction to the Chief Medical Director, The Deputy Chief Medical Director and the Associate Deputy Chief Medical Director for their approvals, and following this, it is presented by the Chief Medical Director and the Assistant Administrator for Construction to the Associate Deputy Administrator for final approval.

Tentative floor plan sketches

The next step is the preparation of tentative preliminary floor plan sketches by the Preliminary Planning Service, on the basis of the Master Plan and the approved block layouts, and in this phase also, HCS works closely with all interested services. These sketches are very carefully reviewed by all concerned, in a series of conferences, and a representative of each service is requird to "sign off" on the finally agreed-upon plan arrangements, indicating his "clearance", or approval. The "cleared" sketches then become the basis for the preliminary plans.

Final preliminary plans

Then the final preliminary plans are prepared by Preliminary Planning Service, in close consultation with HCS. When completed, these plans are first submitted for approval to all interested services and to the Dean's Committee of the affiliated medical school for approval, and then must have the approval also of the Chief Medical Director and the Associate Deputy Administrator, just as with the block layouts. Copies are sent to the hospital involved, for review and suggestions.

With these approvals granted, the AA for C then prepares a detailed construction cost estimate and develops an apportionment request for technical services funds to cover costs of preparing architectural plans and specifications. This request is first reviewed by the *VA* Controller, and he, in turn, submits it to the Bureau of the Budget for review and approval, after which the requested funds are apportioned by the Bureau.

Role of the A-E firm

At this time the independent Architect-Engineer firm enters the picture. A contract with such a firm is negotiated and awarded by the AA for C, subject to the Administrator's approval, and the A-E is provided with copies of the approved preliminary plans, master specifications, a copy of the Master Plan, directives governing the conduct of the work, and an extensive file of standard details and other reference material for his guidance. During development of the architectural drawings and specifications, three interim review conferences are required, when the work is 20%, 40% and 75% completed, and a fourth review conference is of course held when the work is 100% complete. On each of these occasions the A-E is required to mail copies of his drawings in advance to the *VA* Central Office for review by the AA for C, HCS and all interested services, and then to appear in person at the Office of the AA for C and discuss the progress of the work. At each interim stage he is also required to submit construction cost estimates, and at the 75% completion stage this estimate is required to be sufficiently complete to predict actual construction costs with reasonable accuracy. On the basis of this cost estimate by the A-E firm, a request for construction funds is prepared by the AA for C, reviewed by the *VA* Controller, and submitted to the Bureau of the Budget. This is carefully scrutinized, and, if approved, the necessary funds are apportioned by the Bureau.

Construction contract

When the A-E firm has completed the architectural plans and specifications they are submitted to the AA for C for approval, and upon approval, the A-E firm solicits bids from contractors, with the stipulation that bids are to be tendered at the office of the AA for C. The award of the construction contract is made by the AA for C, with the approval of the Administrator.

Responsibilities during construction

During the construction period, the *VA* maintains a resident engineer at the job site. The A-E firm is required, by its contract, to process all office work normally required during construction, such as the checking of shop drawings and preparation of all necessary construction details, and is required to spend one man-day per week at the construction site in general supervisory and advisory work, but is not required to provide full supervision of the work. This is the responsibility of the resident engineer, who is employed by the Assistant Administrator for Construction.

Development of criteria encouraged by Bureau of the Budget

The Bureau of Budget is, of course, responsible for controlling costs of all Federal building, and meticulously reviews all building plans, in search of all possible economies. To facilitate the control of construction costs of hospitals, — not only *VA* hospitals, but also hospitals for the military services and other governmental agencies — it has encouraged the development of Planning Criteria. These are descriptive documents which spell out in minute detail the specific spaces to be provided for the various services and functions of the hospital, with definite floor area allowances for each. The various agencies sponsoring hospitals have collaborated in establishing these Criteria, and each agency has been encouraged to recommend Criteria for the various hospital services and functions, subject to the approval and acceptance of the Bureau. At present, such planning standards have been thus established for a large portion of the total floor area of the hospital, and more are under development.

Criteria basis for Master Plan

These Planning Criteria, wherever applicable, dictate the space requirements listed in the detailed architectural program of the Master Plan, and the latter, in turn, becomes the basis of the preliminary plans which are turned over to the A-E firm for development.

Net times a Gross Factor equals gross area

In the Master Plan are listed, room by room, *all* of the floor area allowances for all services and functions of the hospital, and these are totalled to provide the net square foot area of the hospital. This total, then, is multiplied by an established Gross Factor to determine the maximum total floor area of the hospital (exclusive of boiler plant), and *this area can under no circumstances be exceeded* as the building plans are developed. The maximum total area, in turn, is multiplied by a current unit cost factor to determine the budget cost of the hospital, which must be approved by the Bureau of the Budget before preliminary plans are started.

Establishing the Gross Factor

The Gross Factor currently being used is 1.573, a value which is understood to have been established some six or seven years ago by the analysis of one typical *VA* hospital plan, and it has not been changed at any time since.

Commentary on Present Methods

Two concerns

It is not the desire of the project staff to question the administrative procedures being used. In general, they appear to be eminently sound, providing a thorough consideration of the justification for every project, a detailed and comprehensive study of its programming, and a careful check on its progress at every stage of development. There is some concern, however, about the role played by the A-E firm in the latter stages of the work, and the restrictions placed on the A-E's ability to contribute creatively and effectively to the end results. It is felt, too, that further steps should be taken to insure that planning adequately reflects the requirements of the local educational program.

Use of private A-E firms commendable

Since 1958, private A-E firms have been employed by the Veterans Administration for all major new replacement construction, — about 85% of its total building program. The planning of remodelling work and new construction of a minor routine nature is handled by the office of the Assistant Administrator for Construction. These A-E firms are selected from a list of all those in the country who are qualified by adequate staff and hospital design experience, and who have expressed a desire to be considered. During the past seven years those who have been engaged include some of the largest and best known architectural offices in the country. It appears that experience with this method of operation has been generally satisfactory, and the *VA* is certainly to be commended for its policy of retaining independent practitioners to develop its hospital plans, rather than establishing its own facilities for doing this work.

Best use of A-E talents?

Investigation has revealed, however, that there are certain objectionable features in the present method of operation, and it seems advisable that these be pointed out, since they may particularly affect the provision of educational facilities. The procedures which are questioned are those which serve, in effect, to minimize, if not eliminate, any opportunity for the A-E firm to exercise its own planning ability.

Concern with cost of the hospital

The basic problem relates to budgetary control, but the overall necessity for such control can not be argued. It is the *way* in which this control is exercised, literally stripping the A-E firm of virtually all freedom of design, that is seriously questioned. The major concern appears to be the *cost* of the hospital, rather than its optimum functioning, and further, this concern seems to be limited, really, only to the initial cost. In some cases, this unyielding control has even necessitated accepting unworkable features in the building for the sake of completing its construction, with full knowledge that changes will have to be made immediately upon completion, at greater overall cost.

Three factors contribute principally to the restrictions under which the A-E firm is required to operate: 1) the Planning Criteria, 2) the Gross Factor, and 3) the preliminary plans. All of these are of course summarized and reflected in the preliminary plans.

Pros and cons of Planning Criteria

While the Planning Criteria undoubtedly have essential positive values, their use also has certain disadvantages. On the plus side, they serve not only as planning guides, but also as an agreed-upon set of "ground rules" defining maximum space allowances, thus greatly facilitating the review of plans by the Bureau of the Budget for approval. Areas that have been designed in accord with accepted Criteria are automatically approved, whereas the layout of spaces not covered by such Criteria is subject to detailed critical review, and literally every square foot of such space must have its need justified. On the negative side, there are these disadvantages:

— by freezing design standards and space requirements, they discourage, if not prohibit, original analytical thinking

— they make no allowance for individual differences or special local requirements of hospitals (which are significant in certain educational facilities)

— they are not easily adjusted to changing needs; their inflexibility prevents their being kept up to date.

Gross Factor affects workable solutions

Far more critical, however, in determining the role of the A-E firm, is the Gross Factor. The specific value used for this factor has overriding significance. It determines whether the final plan functions properly or is too "tight" in some areas to be workable. To illustrate, consider that in the case of a hospital having a total net area of 500,000 sq. ft., a change of only .001 in this factor will affect the gross area by 500 square feet; not a very large area, but sorely needed in some plans. In short, the value assigned to this factor governs the success of all planning that follows.

Value of Gross Factor questioned

The adequacy of the basis used for originally determining this factor is seriously questioned. Furthermore, to be kept currently valid, it would seem that its value should be re-analyzed and perhaps revised at least bi-annually, to reflect possible changing requirements of space needed for mechanical services and equipment (such as air conditioning ducts and fans) in the building. It seems very unlikely that the value of this factor should remain constant over a period of six years.

The preliminary plans prepared by the *VA* are thoroughly studied and represent a high standard of planning ability. They represent solutions to the complex and very difficult problem of meeting all the requirements of the Master Plan within the severe limitations imposed by the Gross Factor, and hence are indispensable to the A-E firm under the present method of operation. But because of their very complete and precise nature, these plans virtually dictate the plan solution.

Theoretically, they are provided for the A-E's "guidance", as a suggested solution, but in most cases they prove to be a *prescribed* solution which can be altered by the A-E only in minor respects. They establish not only the mass of the building and the relationship of all elements of the plan, but also the absolute maximum floor area and outside perimeter of the building. Floor heights, and even the location of structural columns are predetermined. They do not, however, establish the character or fenestration of the exterior elevations. The A-E firm is free to suggest changes in layout, too, but only if such changes are within the prescribed area limits. And in some cases minor changes so suggested are accepted and approved by the AA for C.

Preliminary plans usually dictate final solution

While the necessity of providing recommended solutions is recognized, the furnishing of such completely detailed layouts discourages any creative efforts on the part of the A-E firm. In effect, it places the firm in the position of providing not much more than expert drafting services in the development of a solution provided by others. For the "plan factory" type of firm, whose chief interest is in a profitable operation, this kind of "guidance" is no doubt very welcome, because a minimum of intellectual effort is required in carrying out the commission. But for the firm concerned with creating its own best possible solution to a complex architectural problem, the restrictions it imposes are unwelcome, to say the least.

Creative solutions by the A-E discouraged

To find how A-E firms feel about the *VA* method of operation, several architects retained on recent projects were interviewed. Some of the opinions expressed and suggestions offered are thought to be pertinent and should be of interest. It is recognized, however, that in some cases the criticisms offered may not apply to the present method of operation, because procedures are steadily being improved and may have been changed since the instance in question.

Comments by architects

Probably the most significant reaction was the generally expressed desire, in spite of all objections, for the opportunity to do more *VA* work. Even with its faults, therefore, the system, on the whole, must be acceptable. But a number of criticisms *were* offered, — most of them objective in nature, and because they are believed to suggest where improvements should be made if possible, some of these opinions, as expressed by the architects are paraphrased here:

Architects want to do VA work

- "The preliminary drawings are generally good, — much better than they used to be; but they tie us down too tightly."
- "It's a mistake to have such rigid Planning Criteria; they don't allow for the fact that conditions are not invariable."
- "In spite of the completeness of the preliminary drawings, we *do* spend a lot of time studying ways of improving the plans. And some of these suggested improvements are accepted, provided they don't increase the area."
- "The *VA* seems to have a rigid policy prohibiting any original design work by A-E firms."
- "It seems that the *VA* has the wrong concept of architecture; apparently they think it's only the outside treatment of the building."

Types of general comments and criticism

- "There should be closer liaison with the *VA* office while we're developing the plans; they ought to have a man right here in our office a good share of the time."
- "When we run into problems, we have no access to anyone with any power to authorize changes. We encounter things we *know* just won't work, but when we try to have changes approved, we're told that the decision was made by DM&S, and there's no recourse. So we have to go ahead and do things we *know* are wrong, and will surely have to be changed later. That's what gripes us most about *VA* work."
- "On the job site, the *VA* always seems to be able to keep the contractor out of jams, but there's no such help for the design man in the office, when he runs into problems. We get the impression they're on the contractor's side, and against the architect, — which doesn't seem right."
- "We've found that the equipment list provided by *VA* is out of date, as far as some hospital services are concerned, and doesn't reflect currently accepted good practices in these areas."

Comments by medical school faculties

Several interviews were held, also, with members of faculties of medical schools affiliated with recently completed hospitals, to determine their attitudes. In general, there was dissatisfaction expressed here, too. "Does anyone *ever* get what they ask for in a *VA* hospital?" was the typical reaction. Some said they had submitted to the *VA*, during the planning stages, carefully considered written recommendations and suggestions as to requirements, only to have them rejected or ignored. It is believed however, that these cases were processed prior to the adoption of present procedural methods and that theoretically, at least, in hospitals now being planned, there will be no valid grounds for such complaints.

Recommendations for Improving Planning and Design Procedures

These studies and investigations have revealed several aspects of procedure which, in the opinion of the project staff, are objectionable. To what extent they can be improved is debatable, but certain changes appear to be advisable. In the totally objective interests of obtaining not only more adequate educational facilities, but better hospitals, the following recommendations are respectfully submitted:

Medical school to help determine Master Plan

1. Before planning is begun, a statement should be requested from the affiliated medical school outlining its educational policies and explaining how its program is expected to relate to the use of hospital facilities. Later, the Dean's Committee should be asked to provide a more detailed functional program, and this should be given full consideration by the HCS in developing the Master Plan.

Earlier role for A-E firm

2. Some means should be found to bring the selected A-E firm into contact with the job earlier in its development, — preferably before the block layouts are established — so that the architect can take an active part, from the beginning, in planning concepts.

Broader concept of cost

3. There should be a more realistic and meaningful concept of actual building costs, taking into account not only the initial construction cost, but also the costs of maintenance, replacement and *predictable changes* over a period of years.

Review of Gross Factor

4. The value of the Gross Factor should be carefully re-analyzed on a more adequate basis and probably should be increased, and it should be subject to review and revision bi-annually. Also, some special allowance should be made for air conditioned buildings.

Allowance in planning

5. Just as a leeway of 10% is allowed in case construction bid costs exceed estimated costs, there should be a similar allowance of perhaps 2% by which A-E's developed plans may exceed the floor area established by the preliminary plans, *provided* acceptable justification is submitted for any such increase.

Review Planning Criteria

6. All Planning Criteria should be reviewed at intervals not exceeding two years, by independent hospital consultants of recognized authority, to insure their being kept up to date.

Flexible Criteria to meet local needs

7. If educational facilities must be subject to Planning Criteria, sufficient leeway should be provided in such criteria, in respect to types, number and sizes of spaces, to permit planning them in accord with local educational needs.

Liaison between VA and A-E firm

8. More active liaison should be maintained between the Office of the AA for C and the A-E firm during the latter's development of the contract documents.

New term for Master Plan

9. The term "Master Plan", as applied to a program document, is confusing and deceptive to the building profession, and a more appropriate substitute should be found.

Remodeling Existing Facilities

"Building Blocks" may be used for remodeling

At first, this report may appear to be directed solely at the provision of educational facilities in new construction, but this is not the case. The definition and development of appropriate facility types as "building blocks" as has been done in this report, permits them to be readily incorporated in plans for remodeling, as well as in new hospitals. If the existing hospital has or contemplates particular educational programs, and wishes to provide the appropriate facilities, guidance in programming and planning for these facilities has been provided. Of course, details in design will necessarily be modified to fit existing conditions and some desirable relationships among facilities will be compromised because of incompatible floor plans.

Some things eliminated or relocated

Naturally, too, the incorporation of educational facilities within an existing plant will necessitate that some activities be relocated or eliminated. Some types of research activity which now occupy space in the nursing areas could better be relocated to specially designed research facilities and the vacated space could well be turned over for new educational facilities. Other times, the provision of facilities to meet the educational programs on the nursing unit will necessitate the elimination of some patient rooms. The balance among care, research and education must be constantly adjusted when remodeling old, as well as when providing new facilities.

Illustrative planning solutions

To illustrate the incorporation of the recommended educational facilities within existing hospitals, four existing conditions were selected and proposed planning solutions were prepared. Figure 11 indicates part of the nursing floor of a typical, early post-war *VA* hospital. Each floor of the finger-plan type contains four nursing units with related departmental and support facilities. The renovation would provide educational facilities for each nursing unit, as well as floor-related facilities for common utilization.

Several types of nursing floors

Figure 12 is a later *VA* hospital plan based on back-to-back nursing units with a core of support facilities between. Again, the suggested solution would incorporate both nursing unit and floor-related educational facilities. Figure 13 is a still more recent *VA* hospital having a nursing tower with perimeter patient rooms, a continuous corridor and a central core containing support functions. Facilities to support education in the two nursing units and on the floor are indicated in the revised plan.

Incorporating the resources center

Finally, to illustrate how certain services might be organized in close proximity to the medical library or resources center, Figure 14 was developed. The existing plan is a section of the main administrative floor of a *VA* hospital containing a number of departments and services. The proposed plan indicates that the resources center might be located at the center of the area with radiology and pathology on one side, and medical records and medical illustration on the other. In this way, these four services are brought into close physical relationship with the resources center as the "common ground". The concept and objectives of this planning approach were discussed in Part II — 2. "Hospital-wide Facilities."

EXISTING PLAN

1. Social work service
2. Examination room
3. Serving kitchen
4. E.E.N.T. clinic
5. Examination and treatment room
6. Doctor's office
7. Clerk's office
8. 4-bed rooms
9. Nurse station

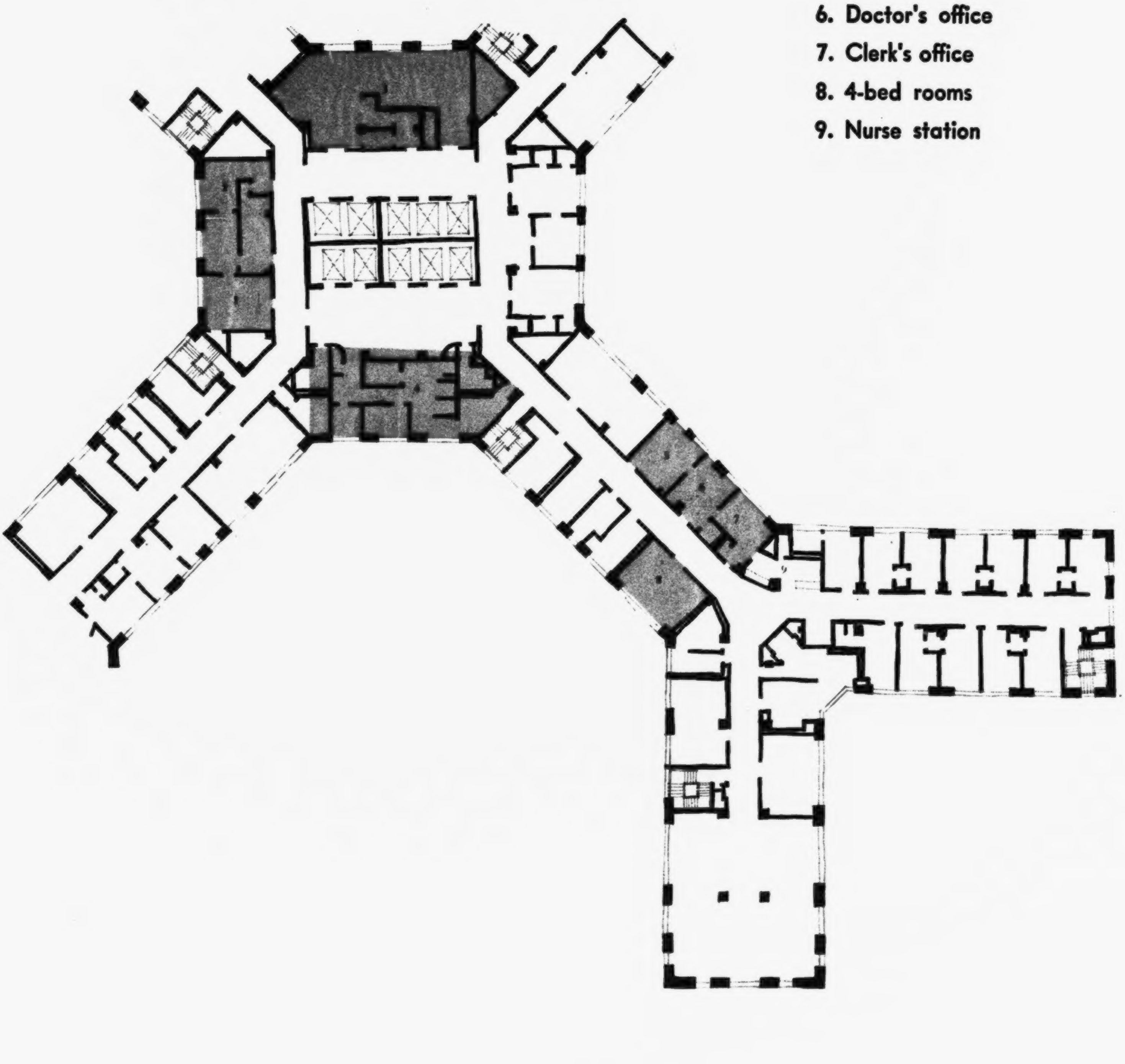


Figure II — Existing plan of finger type floor. Shading indicates areas to be revised to accommodate recommended educational facilities.

REVISED PLAN

1. Classroom
2. Rear projection module
3. Storage
4. Patient preparation
5. Conference
6. Living room
7. Kitchen-dining
8. Bedroom
9. Resource sub-center
10. Consultants' lounge
11. Consultants' locker room
12. Conference room
13. Examination and treatment room
14. Work-study area
15. Doctor's office
16. Clinical laboratory

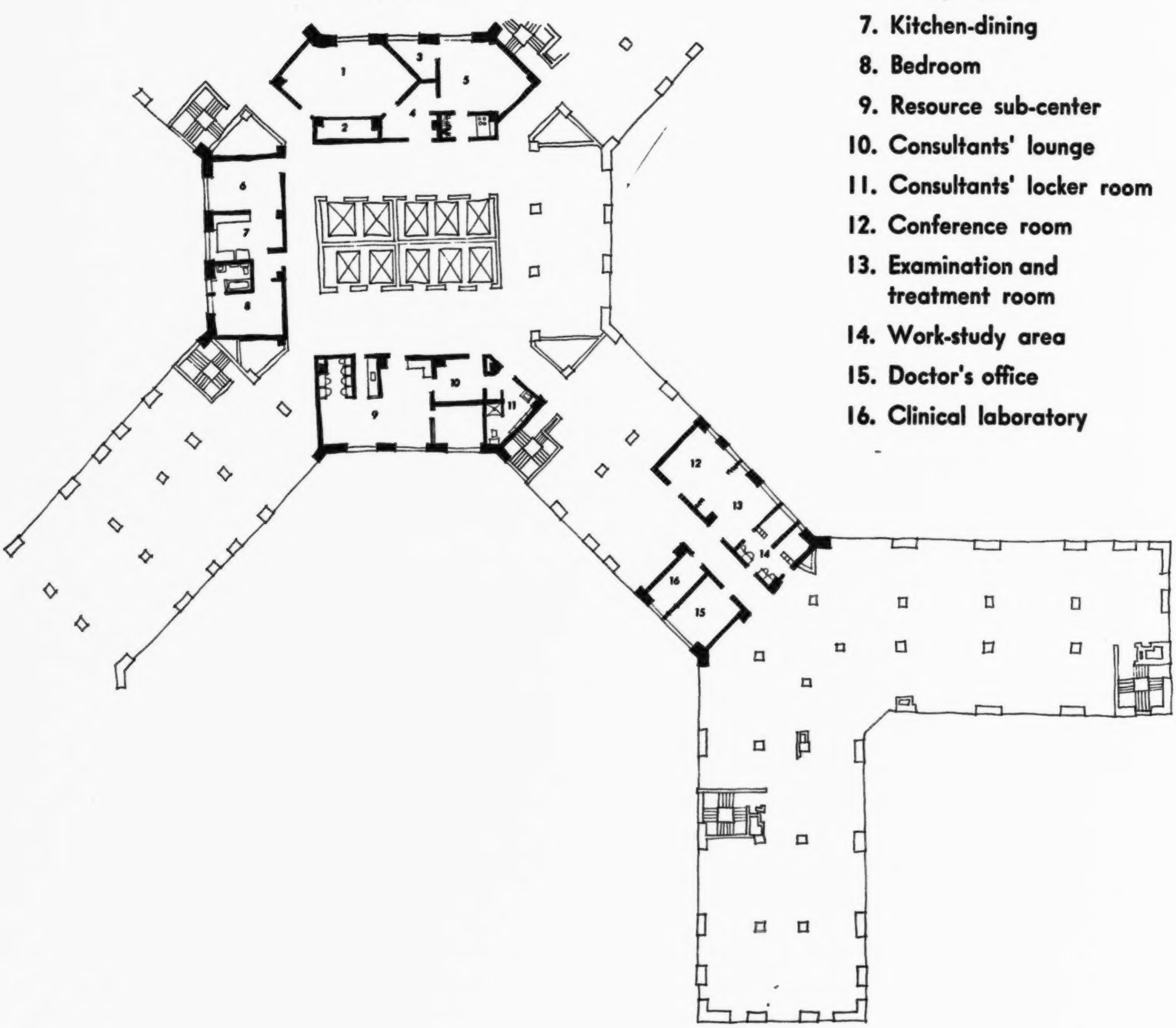
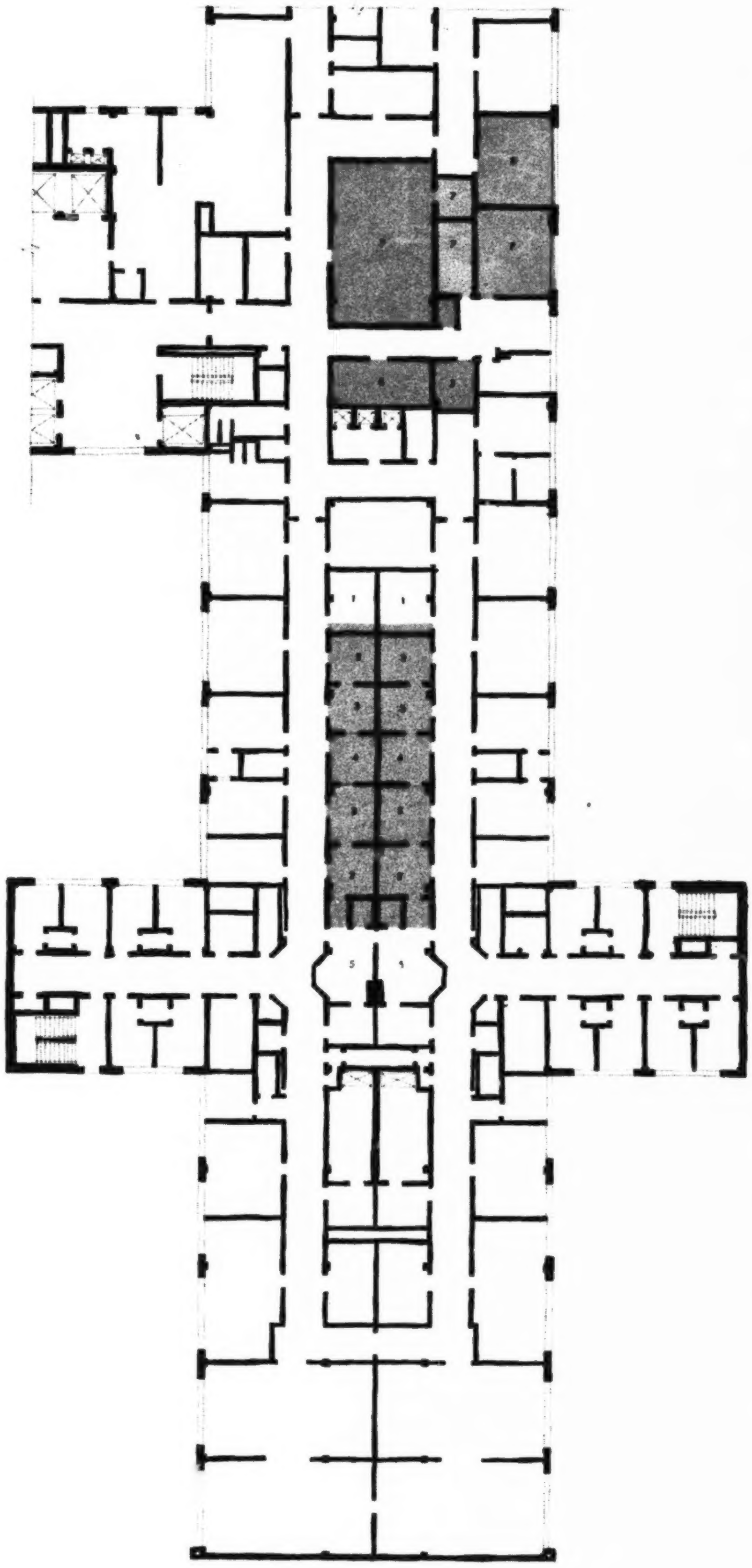


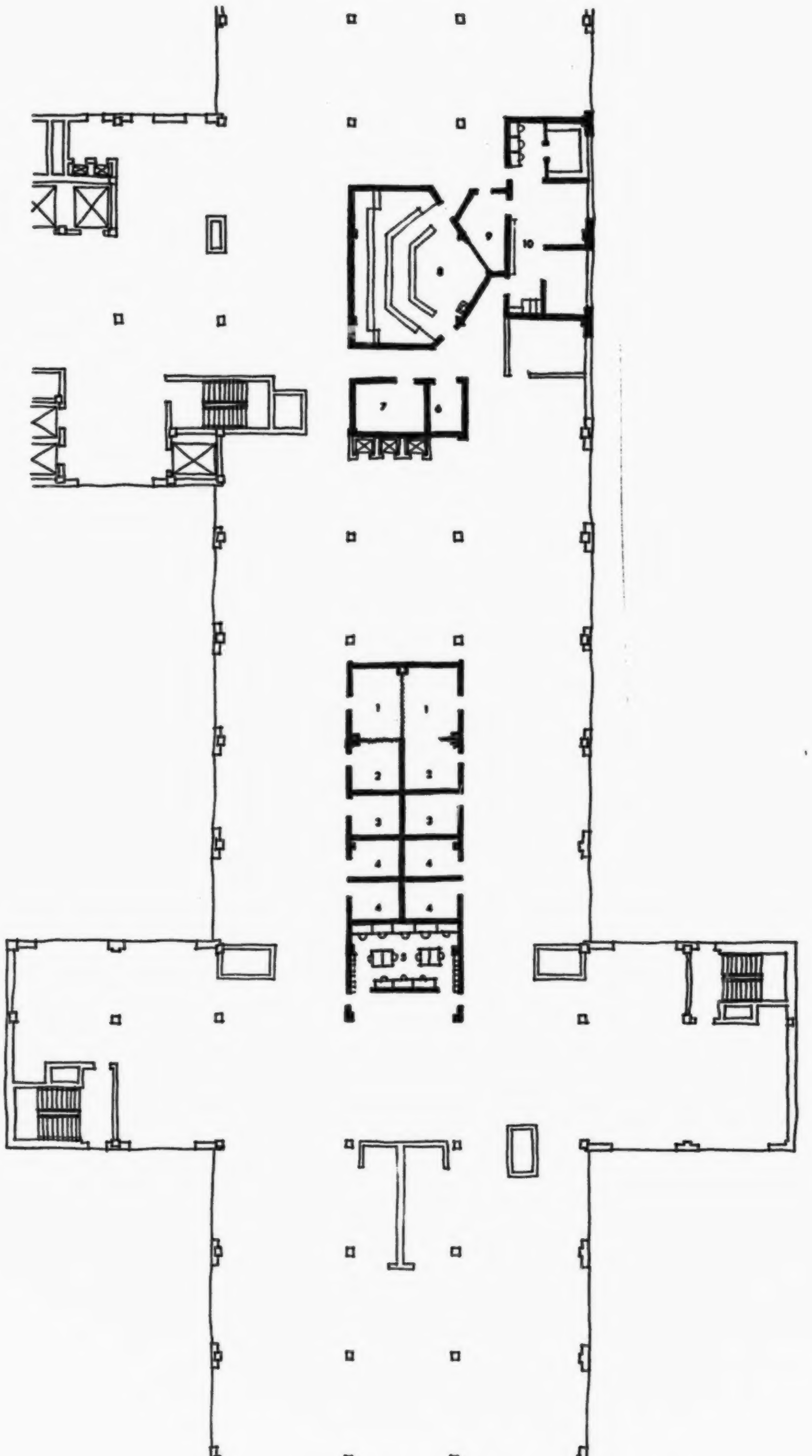
Figure 11 — Revised plan with service, floor and nursing unit facilities. Included are the demonstration suite (6, 7, 8), resource sub-center (9, 10, 11) and a floor oriented conference-classroom suite (1, 2, 3, 4, 5). In order to incorporate those spaces, serving kitchen, clinical activity and offices were relocated. Other educational facilities are related to the nursing unit (12, 13, 14, 15, 16).



EXISTING PLAN

1. Wheel chair alcove
2. Staff offices
3. Examination room
4. Residents' office
5. Nurses' station
6. Residents and trainees
7. Clinical activity
8. 4-bed room

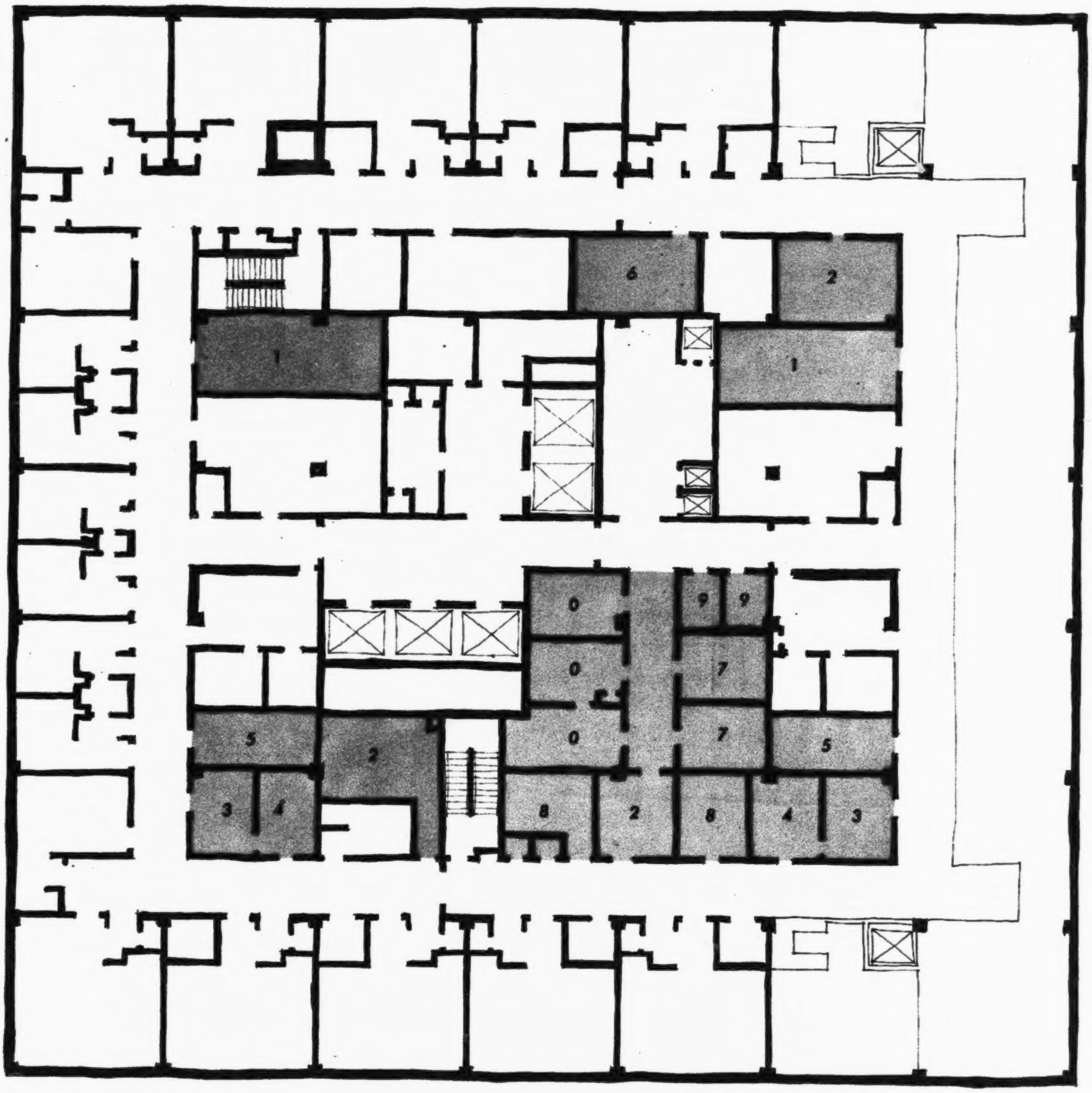
Figure 12 — Shading indicates areas to be revised. In order to provide the resource sub-center and the large classroom, clinical areas and a 4-bed room would have to be relocated and an examination room removed for improved circulation.



REVISED PLAN

1. Conference room
2. Examination and treatment
3. Doctor's office
4. Semi-private residents' office
5. Trainee work-study area
6. Patient preparation
7. Teaching laboratory
8. 40-seat classroom
9. Rear projection area
10. Resource sub-center

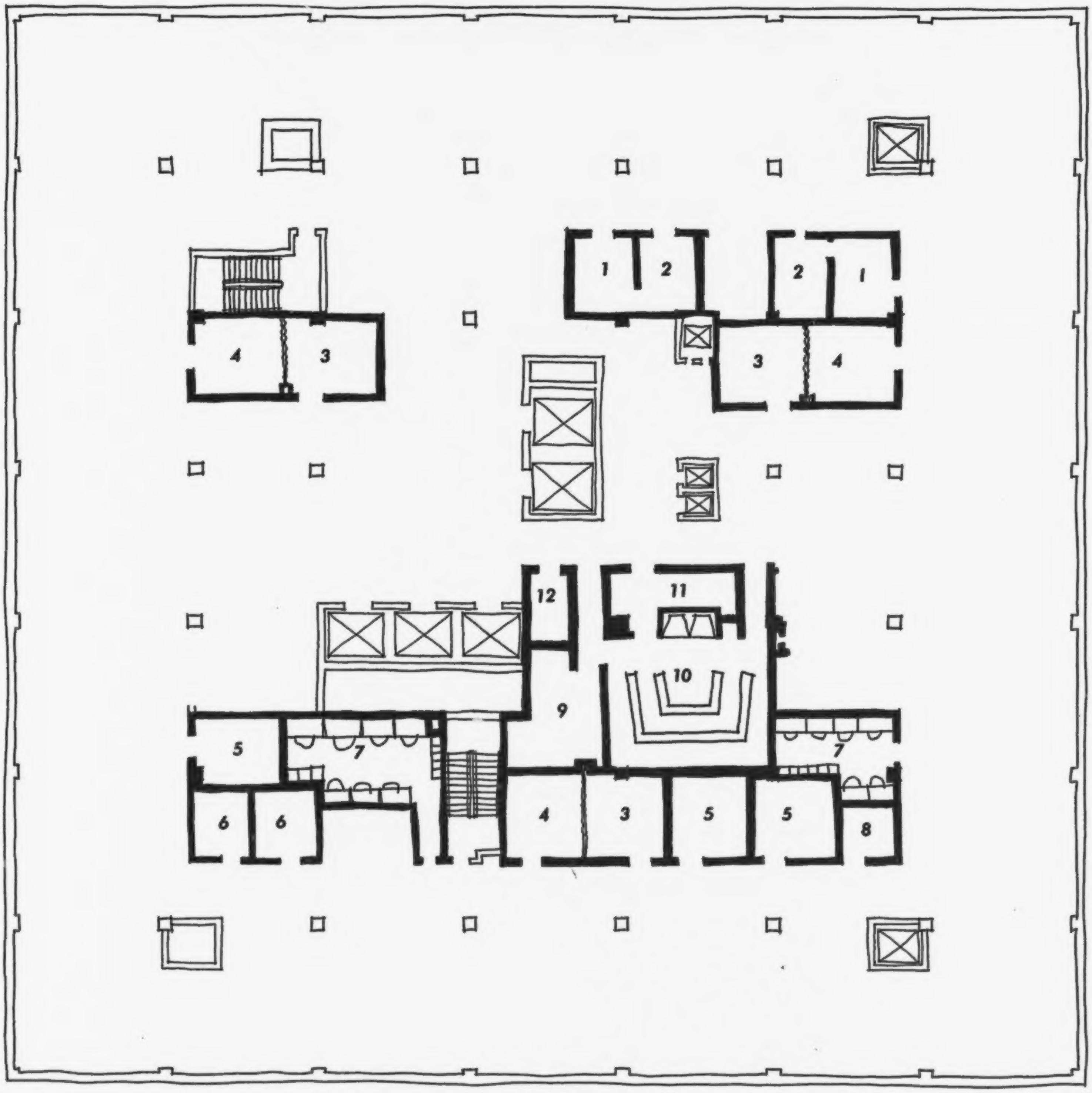
Figure 12 — The revised plan shows a resource sub-center, classroom for 40 and a clinical teaching laboratory related to the office of the chief of service. The work-study area and the residents' offices are related to the nurses' station and examination-treatment rooms. Note that the movable walls allow large or small conferences, as well as patient demonstration and conference combinations.



EXISTING PLAN

1. Classroom
2. Residents' office
3. Doctor's office
4. Examination room
5. Treatment room
6. Treatment laboratory
7. Social worker
8. Bath and storage
9. Toilets
10. Offices

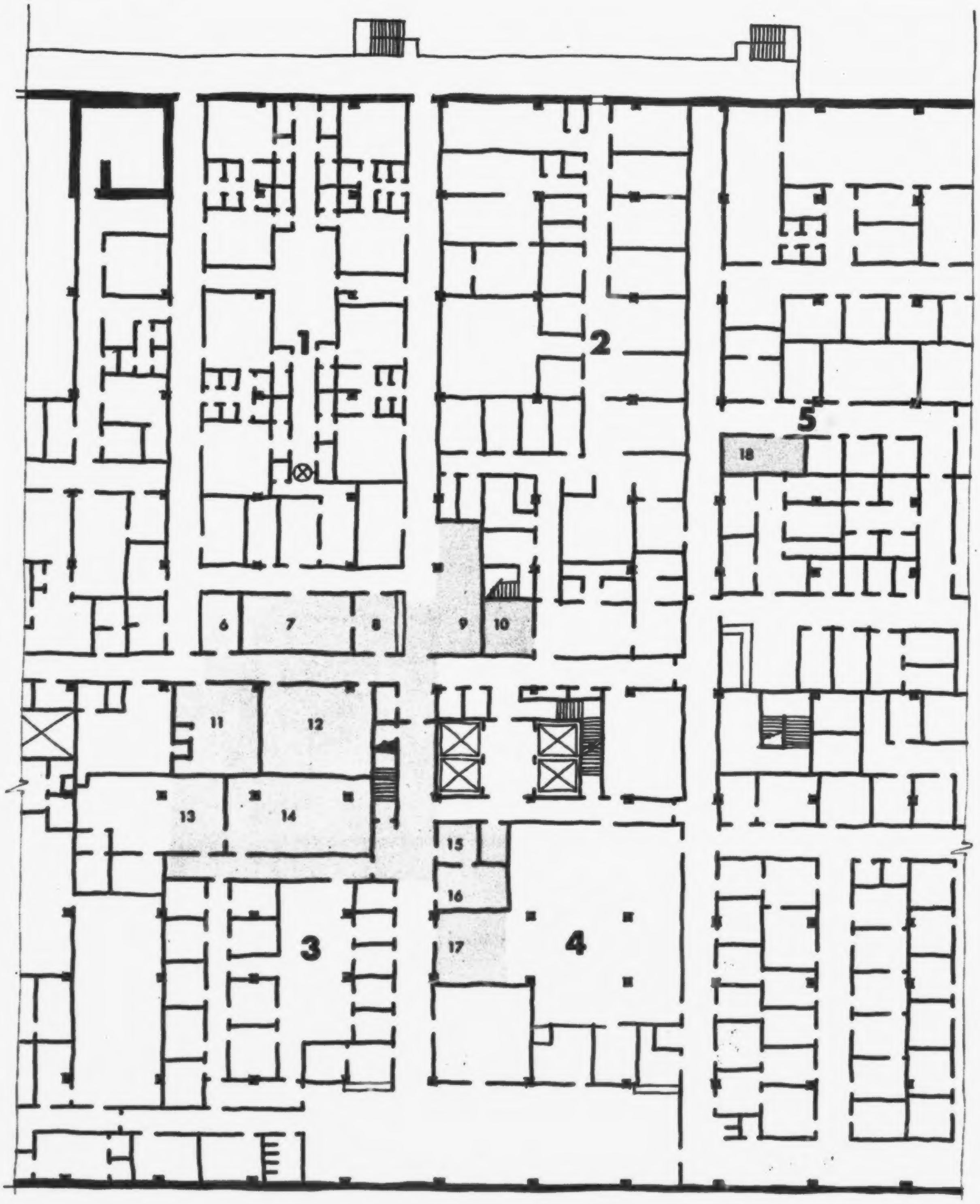
Figure 13 — Existing plan of typical tower floor unit. Shading indicates areas that can be revised to provide recommended floor and nursing unit facilities.



REVISED PLAN

1. Doctor's office
2. Examination room
3. Conference room
4. Examination and treatment
5. Semi-private residents' office
6. Private resident's office
7. Work-study area
8. Interview room
9. Teaching laboratory
10. Classroom
11. Patient preparation
12. Storage

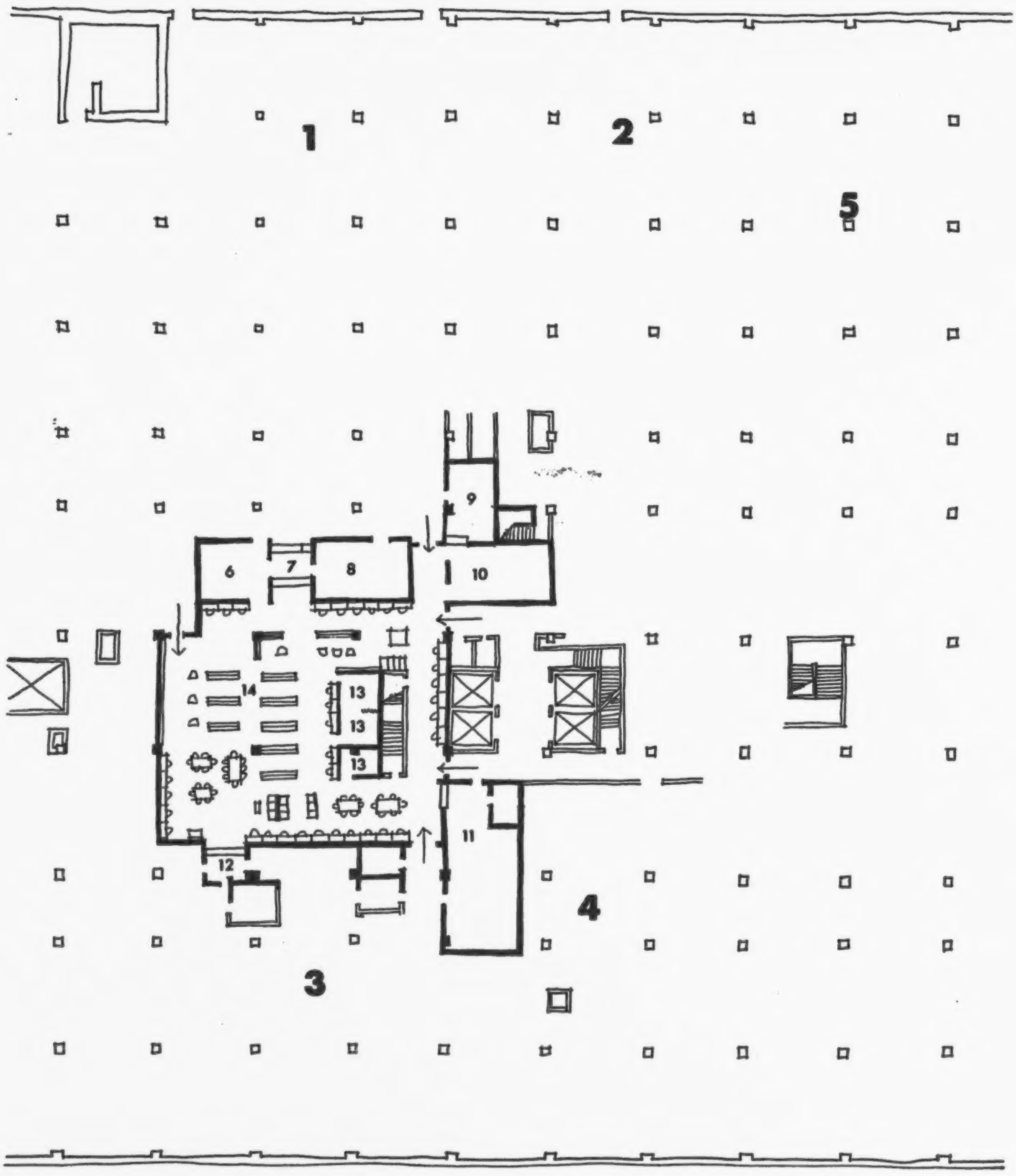
Figure 13 — Revised plan showing nursing unit and floor related facilities including work-study areas, residents' offices, examination-treatment and conference suites, and a clinical teaching laboratory and floor classroom.



EXISTING PLAN

1. Radiology service
2. Pathology service
3. Medical records
4. Registrar
5. Medical illustration
6. Viewing
7. Files
8. Secretary
9. Waiting
10. Secretary
11. Clean supply
12. Conference
13. Medical records clerk
14. Remote transcription pool
15. Registrar's office
16. Secretary
17. Work area
18. Medical illustration files

Figure 14 — Existing plan showing location of radiology, pathology, medical records, registrar, and medical illustration services and departments. The shaded area indicates where alterations would be necessary to incorporate the resources center.



REVISED PLAN

1. Radiology service
2. Pathology service
3. Medical records
4. Registrar
5. Medical illustration
6. Film viewing
7. Secretary and control
8. Film files
9. Microscope slide file and control
10. Microscope viewing
11. Medical illustration storage
12. Medical records control
13. Seminar
14. Resource center

Figure 14 — Revised plan indicates the resource center and its connecting facilities with the surrounding services. In order to accommodate the center, major replanning of the registrar's area and minor changes in the other services would be necessary.

APPENDIX A

1 The Advisory Committee
2 Visits to VA Hospitals
3 Visits to Medical Schools

APPENDIX B

The Invitational Seminar — A Summary

APPENDIX C

Bedside Teaching — An Overview

APPENDIX A

1. The Advisory Committee

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Research and Education in Medicine

Peter Clepper
Hospital Requirements Specialist
Hospital Construction Service

Advisory Committee Meetings

1. Chicago — October 10, 1963
2. Rensselaer Polytechnic Institute, Troy, New York — March 20, 1964
3. New Orleans — November 6 and 7, 1964
4. Washington, D.C. — January 22, 1965

2. Visits to VA Hospitals

Little Rock, Arkansas
21 June 1963

Research, Chicago, Illinois
9 October 1963

Oklahoma City, Oklahoma
8 November 1963

Indianapolis, Indiana
2 December 1963

Syracuse, New York
9 December 1963

Buffalo, New York
10 December 1963

Los Angeles, California
7 January 1964

Palo Alto, California
8 January 1964

San Francisco, California
9 January 1964

Portland, Oregon
9 January 1964

Seattle, Washington
11 January 1964

Albany, New York
22-28 January 1964

Hines, Illinois
19 & 21 May 1964

Cleveland, Ohio
3 March 1965

Durham, North Carolina
9 March 1965

3. Visits to Medical Schools

University of Arkansas
Little Rock
21 June 1963

Northwestern University
Chicago
9 October 1963

University of Oklahoma
Oklahoma City
8 November 1963

Union University
Albany
18 November 1963

University of Indiana
Indianapolis
2 December 1963

University of Kentucky
Lexington
3 December 1963

State University of New York
Syracuse
9 December 1963

State University of New York
Buffalo
10 December 1963

University of Florida
Gainesville
27-28 December 1963

University of California
San Francisco
7 January 1964

Stanford University
Palo Alto
8 January 1964

University of California
San Francisco
9 January 1964

University of Oregon
Portland
9 January 1964

University of Washington
Seattle
11 January 1964

Planning Office
Tufts - New England Medical Center
Boston
7 January 1965

Planning Office
Harvard Medical School
Boston
7 January 1965

Cleveland Metropolitan Hospital
(Western Reserve University)
Cleveland
3 March 1965

Duke University
Durham, N. C.
8-9 March 1965

Other related institutions:

Clinical Research Center
National Institutes of Health
Bethesda, Maryland
6 May 1964

National Library of Medicine
Bethesda, Maryland
6 May 1964

APPENDIX B

The Invitational Seminar — A Summary

One of the most significant and productive phases of the project was the invitational seminar held in Washington, D. C. on June 11 and 12, 1964. Fifteen invitees (a roster of the participants follows the summary) met with the project staff and representatives of the Advisory Council and the *VA* to discuss the "hospital as an instrument for medical education." The objective was not to discuss the details of hospital planning, but rather to draw from a group of experienced and qualified persons the general planning objectives and future role of the clinical teaching environment. It was then to be the task of the project staff to direct the resulting information to the specific objectives and needs of the Veterans Administration.

The participants represented a number of the types of persons concerned with clinical teaching — the medical school professor, the medical school dean, the hospital administrator, the administrator of clinics, the hospital planner, the hospital architect, the hospital consultant, and the professional association staff member. Each brought a unique background while representing these various groups, and yet, each was concerned with one objective — the provision of a suitable environment for clinical teaching.

Each participant was asked to respond informally to two specific questions:

- How can the hospital be designed to render it a more effective instrument for medical education?, and
- What do you see as the future role of the hospital in medical education?

These presentations were followed by several hours of discussion and interaction based on questions posed by the project staff or raised in extension or clarification of previous remarks. The total seminar was recorded and transcribed in its entirety

The following constitutes a summary of the information and discussion of the seminar and is arranged by broad topics. Authorship of specific points is not indicated, but they are presented with the intent of reflecting the tenor and range of concern the group had for each topic. Such "pulse-taking" is always debatable, and some participants are bound to argue that the feeling of the group has not been appropriately stated in all areas. Nonetheless, it is felt that the material of the seminar is eminently worthy of summary and dissemination, in spite of the hazards involved.

1. *The teaching hospital defined*
    - It is the environment for medical care and cure, altered to accommodate the teaching-learning and research processes.
    - The term "teaching hospital" is a misnomer; no hospital teaches, but rather it is a place where learning may take place. The problem is to maximize this possibility while satisfying the requirements of excellent patient care.
    - It is a series of nursing units identified by specialties and held together by treaties. (This definition reinforces the concept of the nursing unit is the basic planning unit, both in terms of care and education.)
2. *On the role of the hospital in medical education*
    - The hospital should not be considered as an adjunct of medical education, but rather the very core around which many facets of medical education revolve.
    - Involvement of medical students in clinical situations earlier in their training seems a definite trend; the center of gravity of initial medical education is shifting toward the hospital. Also, the hospital will be used year around for teaching medical students and medical personnel.
    - Among other tasks, the hospital must become more efficient, effective, and productive in terms of increasing the yield of professionally trained persons to meet the shortages of personnel in the health fields.

- A "teaching hospital" requires additional space throughout, from the administrator's office to the laundry. Enough space to house the additional functions, people and equipment of a teaching hospital is its biggest problem, and may increase the total size by as much as 50%. (From 800-900 sq. ft. per bed for non-teaching to 1200 sq. ft. for teaching hospitals.)
- There is concern, however, that the hospital is concentrating more and more on the acute and the unusual case, while not increasing total care out of proportion to population increases. Therefore, it may become a less desirable place for undergraduate teaching, as it is not yet representative of private practice. In this light, the appropriate role of the teaching hospital may be more in graduate and continuing education.

3. *On the hospital and patient care*
   - The hospital in the medical center seems to be taking on the role of the family physician; the member of the community looks to it for health and hope, no matter what his age or status. In the past, the doctor saw many kinds of patients; now, the hospital is the place where the patient sees many kinds of doctors and medical personnel.
   - The major concern is improving patient care in the face of growing shortages of doctors and health personnel. Medical personnel must find a way for the team to act as the physician without losing the necessary personal nature of care.
   - As the population ages, longer hospital stays with more terminal cases must be accommodated. While the hospital focuses more and more on the critically ill, it must also expand its provisions for those needing only a restorative pause — "motel" or minimum care — and for the vertical or ambulant patient.
   - Patients generally are going to be tested more extensively with a wider range of results through increased use of automated diagnostic equipment. There will be even more testing in the teaching hospital with its sicker patients, more difficult diagnostic problems, and greater variety of available tests. The need for larger and larger clinical laboratories is one certain result.
   - The increased need for isolation and segregation of patients can be better met for care and teaching by scattering about the hospital rather than by providing the isolation wards of the past.

4. *On the role of the hospital in research*
   - The hospital should and must allow for experimentation in operational methods, patient care, and rehabilitation (particularly in *VA* hospitals), in addition to the rapidly expanding programs in clinical research. There is little quarrel with the importance of research, although it can overburden everything else, and must be kept in balance.
   - A full-time staff, such as in the *VA* system, needs a strong research base to be attracted and held. Sometimes particular research facilities will be included to attract a particular type of staff. (A figure of 1,000 sq. ft. of research space per person was mentioned.)
   - Isolation of research activities seems unrealistic, as it interferes with the communication of ideas, the pooling of experience, and the natural and beneficial contacts between members of the health team.

5. *On medical personnel*
   - Medicine is developing a host of new types of medical and paramedical personnel with highly specialized functions As many as 22 different types of personnel may help in the care and cure of a patient. More opportunities to train many more of these people, especially nurses, is a must. They will play an even greater role in health care; one teaching hospital expects their numbers to double within the next eight years.
   - With wages and salaries such a large part of the hospital operating budget, and with the shortages of personnel, the hospital must plan to be convenient and pleasant for them by reducing restrictions in accessibility, circulation, servicing, etc. Staff morale is an essential design concern.

- Much of the technology — automated labs, monitoring devices, communication systems — developed for hospital use is based on saving people's time. Their part in attracting and holding staff, and allowing the staff to be more productive, cannot be overlooked.

6. *On the role of the doctor*

- The role of the independent family physician is diminishing while the role of the hospital with teams of specialists is increasing rapidly. To put it another way, the physician cannot stand alone, but is a specialist and a member of a team which is best housed in the hospital with its array of equipment, services, personnel and electronics.
- There are physicians who are technicians, who are scientists, or who care for patients; more and more of the first two are involved in cure and in teaching in the hospital.
- As the hospital assumes more care and teaching roles, the full-time staff becomes larger, which requires offices, research, and out-patient care facilities for them within the hospital. The doctor's office becomes part of the medical center.

7. *On patient care, teaching and research*

- The triad of care, teaching and research must be constantly examined and kept in balance, or emphasis may be given to one or two in light of local policy.
- Conflicts among the basic functions do arise, but conflict and resulting compromise are not necessarily bad. It is necessary to define and accept objectives, before rationalizing the conflicts.
- Specifically, the conflict of the hospital as laboratory versus hospital as sanctuary (implying protection and care) can be partly rationalized by use of electronic gear for observation, recording, etc. and by use of automation in dispensing medications, laboratory reports, etc.

8. *On the process of planning*

- It is essential to avoid having the process of planning reflect a very vocal minority or one or two highly influential persons with unique needs or strong biases. When people move on, the facilities geared for them often become invalid. Knowledgeable people should make decisions *within* their fields.
- The planning process must consider ultimate size, since so many decisions as to staff, communication, servicing, and productivity are based on this assumption.
- Mock-ups of rooms and spaces for trial and evaluation before final construction should be used much more extensively.
- A medical center, and its parts, is a growing, evolving, changing organism; the planning process cannot be simply cut off at any one point, but must also be a continuing function.
- The methods of planning teaching hospitals seem generally archiac. There should be use of systems approaches, operational research techniques and the other methods developed in industry, business and research. A lack of time, stimulus, and patience, and preconceptions, seem to prevent studying alternatives, new ideas, and innovations.
- Instead of diagnosing the local problem and fitting solutions to it, a combination of standards and intuition are used for planning buildings which are obsolete to start with. No one has asked the right questions and developed the right planning base, but have fallen back on easy solutions ("old methods work fine") and standards and factors.
- For the teaching hospital, a thorough understanding of teaching functions and the science of learning is a prerequisite to planning. Too often the architect and the finance person determine educational programs and developments, because the medical auditor has not spelled out needs in appropriate terms. Buildings limit programs, but the limits have been imposed by people.

- In planning, it is necessary to keep looking at the whole problem, rather than isolated parts. It is possible to solve the specific and never see the overall solution. Part of this is maintaining balance in planning; for instance, the availability of grants from foundations and federal agencies may shape a program beyond logic or reason.

9. *On the medical center concept*

- The interdependence of the units of a medical center and the many disciplines which are pooled togother give the center a university quality. It is important that the *VA* hospital be a part of this setting.
- With the trend of introducing medical students to patient care in their first year, the proximity and relationship of basic science teaching areas to patients becomes more critical within the medical center.
- The medical center, and in turn the hospital, is directly tied to the community, its future developments and plans, including urban renewal, and the programs of its institutions. It is necessary to define and consider the range and reach of the medical center and its part in the community and the region to avoid duplication and to provide for complementary programs and regional cooperation.
- Increased ambulant care needs are best served by urban medical center locations near public transport. Also, as ambulant care extends more into the home, the proximity of home and hospital becomes important.

10. *On planning the teaching hospital*

- Planning a hospital is like planning a city; it serves many groups and interests which must all be related. It is bound to be staff-oriented, which may not necessarily be wrong. In fact, some old hospitals are considered well planned, because they have been adapted to staff needs and conveniences.
- Planning and design must be assessed in terms of what has been put in positively to make education feasible, and what has inadvertently been introduced which is a barrier. The little irritations created by poor planning become the major problem.
- Functionally, circulation and flow of visitors, patients, staff, supplies, food, services, etc. seems the most critical planning problem. It is necessary to differentiate types and degrees, particularly in terms of the increasing traffic between the hospital and the outside world. All new developments should be investigated, particularly escalators and other vertical elements. Horizontally, loop corridors seem superior to dead ends — L's, T's, etc. The planning of flow must solve the problems of disposal, particularly disposal of disposables.
- The planning of the teaching hospital is greatly complicated by having to accommodate intensive care at one end of the spectrum and ambulant and "motel" care at the other.
- Although it is important to plan a teaching hospital to allow informal learning interactions among all the various people involved, there does seem a point where too many such interactions tend to dissipate time and energies.
- Economy of space is shortsighted; what is a minimum area now will become impossible to use later.
- It is essential to provide appropriate educational facilities to attract a teaching staff as well as to accommodate and support learning. Facilities for students and residents to think, work, and use records and information, and to dignify their role, are important, as is a strong, well-equipped central library and an auditorium to provide community health services as well as in-service training. However, it is difficult to legislate the use of space — "think here, communicate there," and so on. The hospital must provide alternate locations and choices for housing learning.

11. *On planning for change*

- It is essential to design and build teaching hospitals which permit later change and modification; growth and developments are inevitable and the building must allow for change and expansion without crippling existing functions.
- One approach is to plan large, high-ceilinged, contingous, air-conditioned floor areas free of structural columns and utility shafts and which will permit internal changes. Circulation areas should also be planned with open ends for unanticipated additions.
- It is necessary to define the areas of greatest potential change and plan to accommodate such changes from the outset. Such areas include clinical laboratories and research facilities.
- Allowing for change is often more an attitude on the part of planners than a physical solution; sometimes it involves changing the label on a door. Convertibility anticipates change and is probably a better approach than flexibility which implies indecision. Convertibility may go too far in usurping educational spaces for research or other "paying" programs. There is a need to provide for projects which may need space for a year or so which is then converted to other uses.
- There are times when renovation is essential; planning for tearing down is not bad planning.

12. *On architectural character*

- Why must all medical centers look alike? Why must they all be monolithic masses which seem incompatible with the dignity and scale of the humans who use its facilities?
- There is so much in a hospital which is negative that the challenge is to make them attractive, elevating, reinforcing and conducive to learning and cure. Simplicity in design is important; avoid tricks. Unfortunately, government agencies always seem to put checks on the creativity of the architect.

13. *On instructional functions and processes*

- There is a need to objectively examine teaching processes in the hospital towards introducing improvements and replacements in light of developments in technology and communication techniques. This is particularly true of those functions that have become ritualized.
- Teaching methods must be developed to implement expanded paramedic personnel training programs; with the essence of today's education in medicine being teamwork, teaching methods and processes will be integrated and interdisciplinary in function, faculty, and facilities.
- The use of teaching aids, media or technology should not be considered as supplanting other teaching methods, but rather as supplementing the existing. These new methods are particularly important in making the learner more active and responsive. They do require support and production facilities and space designed specifically to permit their use.
- Non-grading as a means of individualizing learning is a part of most medical education, but there are legal barriers to completely differentiated scheduling and no grades. Elective courses and special projects provide a degree of individualization.
- Permitting the faculty and staff to observe students during clinical performances is considered significant by some, but raises concerns as to the effect on the student and the patient, and the possibility of inhibiting free communication and learning.

14. *On servicing, equipping, and financing*

- More supplies are used in patient care in a teaching hospital since more people are involved in care and more patients are seriously ill. The trend towards pre-packaging of meals, drugs, and service items and their storage at the point of use, helps alleviate some of the additional supply burdens.

- Developments in science and medical cure have introduced tools for diagnosis, treatment, therapy, and rehabilitation that must be located in the hospital because of their cost and servicing. There is an ever-increasing investment in heavy hardware and equipment and automated devices which require more special personnel and utilities, additional space, and supporting services, and special building features such as heavy structure and shielding.
- The hospital makes available a full array of physicians, paramedics, technology and equipment for the care and preservation of life, which represents an enormous capital and operational budget. These must be used efficiently. Medical care is riding a crest of popularity and public faith which may mean that necessary resources will not be as available in the future as they are now.

15. *On planning the nursing station*

- The nursing station is the hub of patient care and its planning deserves great time, thought, and study; it is an area that should be mocked-up and studied and revised towards perfecting its design. The saving of staff time and staff convenience are particularly important design criteria.
- Resident offices and examining rooms are important on the nursing station as a recruitment tool for house staff, as well as for patient care and teaching. Medical student rooms, seminar-conference rooms, consultation-interview rooms, and treatment and demonstration rooms, as part of or adjacent to the nursing station, are necessary to support teaching. (Opinion as to the need for student labs was not unanimous.)
- Nursing stations specifically designated for teaching are feasible, but not necessarily desirable. Variations in the intensity and type of teaching within various stations can be qualitatively important.

16. *On planning the O.P.D.*

- The importance of the ambulant patient, and hence the out-patient facilities, for teaching is growing significantly. It introduces students to patients in less dramatic and more typical surroundings than on the ward, and it is an important element in teaching the patient in preventive care. It is, therefore, necessary to restructure the ambulant setting to make it more effective in the educational process.
- Prepaid, comprehensive care plans, and the concept of ambulant care as part of a continuum of care, all point to much larger OPD's drawing more and more on the diagnostic and therapeutic facilities of the hospital.
- There seem to be few benefits to be gained from specialized, isolated clinics. However, all clinic areas need examination rooms, conference rooms and interview rooms to support the teaching programs involving medical students, nurses, social workers, house staff, etc.

17. *On the need for continuing education*

- It is increasingly important to provide education and training opportunities for the faculty and staff, the practitioners, the paramedical personnel, and the general public. The objective is to share new knowledge and information towards keeping the groups abreast of their fields and interests and to ease the burdens of some medical personnel. It is in the teaching hospital and the medical center that continuing education can best be accomplished.

18. *On communication and information*

- The developments in communication — messages, information and data, records, reports, specimens, physiological data — may allow hospitals to become increasingly decentralized, in lieu of the large concentrated buildings of the present.

- There must be concern with the flow of information within the hospital, the medical center, and the community. The right information must be available to the right people at the right time and in usable form. The hospital library is part of this system, as are regional and national communication networks.
- In teaching, information must be right for the situation — clear and meaningful, at the student's level of ability and learning, and in the proper amount. Data must be retrievable at the point of teaching, learning, and thinking. New courses, new configurations in learning, will impose new demands on communication and data retrieval.
- Evidently the hardware is available, though very costly, to make medical records available between any points in the country. However, there was no concensus as to the value of medical records and the role they should play in education.

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APPENDIX C

Bedside Teaching — An Overview

One of the important aspects of clinical education that is undergoing study and change is bedside teaching; in a teaching hospital the conduct of teaching in a patient room is a major planning consideration. It is well to review current thinking and possible alternatives before committing the fabric of the hospital to any one particular teaching philosophy.

The grand or professorial round may involve as many as 50 residents, interns, medical students, student nurses, and various other staff and trainees led by the professor or service chief from the bed of one interesting case to that of another. Standing four and five deep around the patient's bed, only the few at the front can see, much less palpate the patient, and the paradox of the professor speaking loud enough for all to hear without other patients hearing the intimate details of the examinee, is never overcome. The displaying of x-rays, EKG's, and significant parts of the patient's record are impossible; the patient either becomes overcome and recalcitrant by the size and majesty of the group, or responds as an actor behind the footlights. The student or house officer called on during the presentation is given to equally affected responses. Certainly, the confusion and potential anxiety created by this type of teaching cannot be considered as beneficial for patient care.

Bedside rounds of this type are losing favor and are being replaced by more effective instruction held in rooms specifically designed for the purpose. Many more persons can both see and hear the presentation and discussion; all the information explaining and amplifying the case can be displayed and discussed effectively. The patient himself may be presented in person, by tape or film, or remotely by television. Depending on the size of the group, the instruction may be formal or may involve informal interchange.

There are some bedside teaching situations involving a preceptor, several house officers, and one or two student clerks gathering around the patient's bed in the ward or multi-bed room, that can be effective:

if the patient being examined and discussed feels confident and secure, his responses are accurate and useful, and he does not feel his medical confidences are being unduly compromised.

if the teaching does not have an adverse effect on any other patients in the room.

if the room is adequately equipped for whatever examination is necessary, and means are available for displaying or using any necessary explanatory data in the form of x-rays, records, pathological slides, EKG's, etc.

if the group is small enough that all can gather around the bed to see, hear, and palpate without crowding other patients or requiring the rearrangement of beds. Usually, six to eight persons will be the maximum for these conditions.

if the presence of other patients in the room does not create a barrier in the learning process. This is particularly a concern when student clerks are being taught techniques such as physical diagnosis; their shyness with patients and their ineptness may mean that the learning situation will be less effective due to the presence of the other patients.

In the ward, or multi-bed room, it is difficult to satisfy all of these conditions. One approach is the provision of treatment rooms on the nursing floor where the bedridden patient may be taken, and which provide the private environment necessary for good teaching — and good patient care.

In spite of the rational and desirable advantages of taking the patient out of his room and into an appropriate instructional environment, there are many in medical education who argue that the natural setting at the bedside is the most effective and desirable for teaching. To overcome all the five obstacles previously mentioned, this teaching must necessarily be accomplished in a private room. Indeed a significant trend in hospital planning during the past twenty years has been the provision of a higher percentage of private patient rooms in the typical hospital, and a decrease in the number of beds provided in large 12, 16 or 20 bed wards. Increased insurance coverage, greater length of stay, expansion of hospital facilities, and greater concern with patient attitudes have all abetted this trend.

There are a number of hospital administrators and members of medical staffs about the country who feel that ideally a hospital would consist entirely of private patient rooms. They argue that:

1. Every private room is a usable room, while 5 to 10 per cent of the beds in a hospital with the typical mix of accommodations are unusable due to problems of isolation, and differentials in age, sex, degree of illness, and sociological background of multi-bed room occupants. With every room usable, bed occupancy is at a high level, and the financial picture is more attractive.
2. Private rooms provide the highest degree of flexibility and interchangeability of use — isolation rooms can become chronic rooms, medical can change to surgical, pediatric to geriatric, intensive care to ambulant care, etc.
3. A large part of the time of nursing, medical and administrative staff is spent in handling minor patient complaints created by multiple room occupancy — too many visitors, radio plays too loud, snores too loud, talks too much, reads too late, etc. Single rooms eliminate many of these petty problems.
4. Every single room can be a private, though not necesarily effective, environment for medical teaching at the bedside.

Though making an impressive case for the private room in a community, university, or private hospital, these points are not as totally significant in the case of the Veterans Hospital. With no pediatric and few women patients, the problems of patient mix are reduced. And the chronic, long-term stay of a substantial part of the *VA* patients renders the social aspects of multi-bed rooms desirable rather than detrimental. In fact, it has been observed in the *VA* hospitals that as long as a patient is well enough to be in a multi-bed room, he feels he is getting along satisfactorily, but when he is moved into a private room, his morale, and in turn, his health, may take a turn for the worse.

Also, private rooms not only require more total floor area, but to maintain all the flexible and interchangeable advantages of private rooms, each should have a private bath. For the particular needs of the *VA*, this approach seems inappropriate. The mix of single, semi-private and 4, 5 and 6 bed rooms, as planned in the more recent *VA* hospitals, seems to be a logical solution.

As to teaching, the private room is often too small to accommodate more than 4 to 6 at the bedside; when larger groups are involved, it will still be necessary to take the patient to the treatment room, the conference room or the classroom. One alternative is to increase the number and size of private rooms available for bedside teaching. Even though there are advantages to the private room, merely enlarging them to accommodate teaching is, for two reasons, not the practical answer for most teaching hospitals, much less for *VA* hospitals.

1. A part of the increased space could be far better put into private treatment and consultation rooms which would upgrade patient care as well as teaching.
2. An enlarged private room, under pressure, easily becomes an adequate semi-private room or a very crowded three-bed room.

For teaching with the critically ill patient who should not be moved, the bedside is still the proper place, and the private room is still the best environment, but the group involved should be no more than the 4 to 6 who can be readily accommodated.

This suggests then, that for effective bedside teaching, situations involving more than 8 people are best accommodated in the teaching auditorium, the teaching room, the treatment room or the conference and seminar room. If all the conditions for good patient care and instruction can be met, groups of fewer than eight may well be handled at the bedside, but the private room will do this best. It is not logical, however, to enlarge the size of the private room merely for this purpose. For the critically ill patient a small group at the bedside in a private room is undoubtedly the best environment.